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Ecology Against Capitalism

JOHN BELLAMY FOSTER

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Preface

The argument of this book is that the realms of ecology and capitalism are opposed to each other—not in every instance but in their interactions as a whole. This approach is distinguished from those that attribute the present global ecological crisis largely to fixed human nature, modernity, industrialism, or even economic development per se, in that it offers reasonable grounds for hope that our most serious environmental problems can be overcome without abandoning the prospect of human progress—but only if we are willing to carry out fundamental social change, in such a way as to make a more sustainable relation to the environment possible.

The chapters that make up *Ecology Against Capitalism* were originally written as separate essays in what amounted to a running critique of mainstream economic approaches to environmental crisis under capitalism, conducted over the years 1992–2001. The writing of this book occurred during the same period in which I was doing the research and writing for *The Vulnerable Planet: A Short Economic History of the Environment* (1994, 1999), and *Marx's Ecology: Materialism and Nature* (2000). There is, however, little duplication between these three works, which are meant rather to complement each other. *The Vulnerable Planet* provided a brief historical sketch of ecological degradation from precapitalist societies up to the present. *Marx's Ecology* began the difficult task of unearthing the legacy of materialist understandings of nature and ecological crisis, taking the story up to the deaths of Darwin and Marx in 1882–1883. (I am now working on a further volume that will carry the story forward.) *Ecology Against Capitalism*, as distinct from these other works, is less concerned with providing a single historical narrative, and instead represents an attempt to intervene directly in contemporary political-economic debates on capitalism and the environment—in the process touching on such concrete issues as the spotted owl, the export of hazardous wastes, and global warming.

Naturally enough, those persons to whom I am most deeply indebted, since they consist of many of my closest friends and colleagues, overlap with those whose support I acknowledged in my two previous books on ecology, leaving me doubly and triply grateful in some cases. I wish to thank Paul Burkett, Carlos Castro, Brett Clark, Michael Dawson, Michael Dreiling, Barbara Epstein, Daniel Faber, Chuck Hunt, John Jermier, Vicki Larson, Fred Magdoff (who co-authored one of the essays in this book), Harry Magdoff, Bob McChesney, David Milton, Claude Misukiewicz, Jason Moore, Andrew Nash, James O'Connor, Ira Shapiro, John Simon, Paul Sweezy, Victor Wallis, and Michael Yates. To my family, Bill Foster, Laura Tamkin, Saul Foster and Ida Foster, I owe the discoveries of daily life and a constantly renewed sense of wonder.

Ecology Against Capitalism is dedicated to Paul Sweezy and Harry Magdoff, who have never doubted that the present as history is open, to be made or unmade through human struggle, though not entirely under conditions of our own choosing.

1—Ecology Against Capitalism

In a 1963 talk on “The Pollution of Our Environment” Rachel Carson drew a close comparison between the reluctance of society in the late twentieth century to embrace the full implications of ecological theory and the resistance in the Victorian era to Darwin’s theory of evolution:

As I look back through history I find a parallel. I ask you to recall the uproar that followed Charles Darwin’s announcement of his theories of evolution. The concept of man’s origin from pre-existing forms was hotly and emotionally denied, and the denials came not only from the lay public, but from Darwin’s peers in science. Only after many years did the concepts set forth in *The Origin of Species* become firmly established. Today, it would be hard to find any person of education who would deny the facts of evolution. Yet so many of us deny the obvious corollary: that man is affected by the same environmental influences that control the lives of all the many thousands of other species to which he is related by evolutionary ties. (*Lost Woods: The Discovered Writing of Rachel Carson*, pp. 244–45)

There are numerous reasons for this common failure to acknowledge the ecological basis of the human condition. Many have seen this as a deep cultural flaw of Western civilization, flowing out of the concept of the “domination of nature,” the idea that nature exists to serve humans and to be a servant to humans. But a large part of the answer as to why contemporary society refuses to recognize the full human dependence on nature undoubtedly has to do with the expansionist logic of a capitalist system that makes the accumulation of wealth in the form of capital the supreme end of society.

Orthodox economics, as is well known, defines itself as a science for the efficient utilization of scarce goods. But the goods concerned are conceived narrowly as market commodities. The effects of the economy in generating ecological scarcities and irreversible (within human time frames) ecological degradation are beyond the purview of received economics, which, in line with the system it is designed to defend, seldom takes account of what it calls “external” or “social” costs.

Capitalism and its economists have generally treated ecological problems as something to be avoided rather than seriously addressed. Economic growth theorist Robert Solow wrote in the *American Economic Review* in May 1974, in the midst of the famous “limits to growth” debate, that, “if it is very easy to substitute other factors for natural resources, then there is in principle no ‘problem.’ The world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe.”

Solow, who later received the Nobel Prize in economics, was speaking hypothetically and did not actually go so far as to say that near-perfect substitutability was a reality or that natural resources were fully dispensable. But he followed up his hypothetical point by arguing that the degree of substitutability at present is so great that all worries of Doomsday ecological prophets could be put aside. Whatever minor flaws existed in the price system, leading to the failure to account for environmental costs, could be cured through the use of market incentives, with government playing a very limited role in the creation of such incentives.

What had outraged orthodox economists such as Solow, when a group of MIT whiz kids first raised the issue of the limits to growth in the early 1970s, was that the argument was premised on the same kinds of mathematical computer forecasting models, pointing to exponential growth trends, that economists frequently used themselves. But in this case, the focus was on exponential increases in the demands placed on a finite environment, rather than the magic of economic expansion. If the forecasting of the limits to growth theorists was full of problems, it nonetheless highlighted the truism—conveniently ignored by capitalism and its economists—that infinite expansion within a finite environment was a contradiction in terms. It thus posed a potential catastrophic conflict between global capitalism and the global environment.

Capitalist economies are geared first and foremost to the growth of profits, and hence to economic growth at virtually any cost—including the exploitation and misery of the vast majority of the world’s population. This rush to grow generally means rapid absorption of energy and materials and the dumping of more and more wastes into the environment—hence widening environmental degradation.

Just as significant as capitalism’s emphasis on unending expansion is its short-term time horizon in determining investments. In evaluating any investment prospect, owners of capital figure on getting their investment back in a calculable period (usually quite short) and profits forever after. It

is true that a longer-term perspective is commonly adopted by investors in mines, oil wells, and other natural resources. In these areas the dominant motives are obviously to secure a supply of materials for the manufacture of a final product, and to obtain a rate of return that over the long run is exceptionally high. But even in these cases the time horizon rarely exceeds ten to fifteen years—a far cry from the fifty-to-one hundred year (or even more) perspective needed to protect the biosphere.

With respect to those environmental conditions that bear most directly on human society, economic development needs to be planned so as to include such factors as water resources and their distribution, availability of clean water, rationing and conservation of nonrenewable resources, disposal of wastes, and effects on population and the environment associated with the specific locations chosen for industrial projects. These all represent issues of sustainability, i.e., raising questions of intergenerational environmental equity, and cannot be incorporated within the short-term time horizon of nonphilanthropic capital, which needs to recoup its investment in the foreseeable future, plus secure a flow of profits to warrant the risk and to do better than alternative investment opportunities.

Big investors need to pay attention to the stock market, which is a source of capital for expansion and a facilitator of mergers and acquisitions. Corporations are expected to maintain the value of their stockholders' equity and to provide regular dividends. A significant part of the wealth of top corporate executives depends on the growth in the stock market prices of the stock options they hold. Moreover, the huge bonuses received by top corporate executives are influenced not only by the growth in profits but often as well by the rise in the prices of company stock. A long-run point of view is completely irrelevant in the fluctuating stock market. The perspective in stock market "valuation" is the rate of profit gains or losses in recent years or prospects for next year's profits. Even the much-trumpeted flood of money going into the New Economy with future prospects in mind, able momentarily to overlook company losses, has already had its comeuppance. Speculative investors looking to reap rich rewards via the stock market or venture capital may have some patience for a year or so, but patience evaporates very quickly if the companies invested in keep having losses. Besides investing their own surplus funds, corporations also borrow via long-term bonds. For this, they have to make enough money to pay interest and to set aside a sinking fund for future repayment of bonds.

The short-term time horizon endemic to capitalist investment decisions thus becomes a critical factor in determining its overall environmental effects. Controlling emissions of some of the worst pollutants (usually through end-of-pipe methods) can have a positive and almost immediate effect on people's lives. However, the real protection of the environment requires a view of the needs of generations to come. A good deal of environmental long-term policy for promoting sustainable development has to do with the Third World. This is exactly the place where capital, based in the rich countries, requires the fastest return on its investments, often demanding that it get its initial investment back in a year or two. The time horizon that governs investment decisions in these as in other cases is not a question of "good" capitalists who are willing to give up profits for the sake of society and future generations—or "bad" capitalists who are not—but simply of how the system works. Even those industries that typically look ahead must sooner or later satisfy the demands of investors, bondholders, and banks.

The foregoing defects in capitalism's relation to the environment are evident today in all areas of what we now commonly call "the environmental crisis," which encompasses problems as diverse as: global warming, destruction of the ozone layer, removal of tropical forests, elimination of coral reefs, overfishing, extinction of species, loss of genetic diversity, the increasing toxicity of our environment and our food, desertification, shrinking water supplies, lack of clean water, and radioactive contamination—to name just a few. The list is very long and rapidly getting longer, and the spatial scales on which these problems manifest themselves are increasing.

In order to understand how the conflict between ecology and capitalism actually plays out at a concrete level related to specific ecological problems, it is useful to look at what many today consider to be the most pressing global ecological issue: that of global warming, associated with the "greenhouse effect" engendered when carbon dioxide and other "greenhouse gases" are emitted, trapping heat within the atmosphere. There is now a worldwide scientific consensus that to fail to stop the present global warming trend will be to invite ecological and social catastrophe on a planetary scale over the course of the present century. But little has been achieved thus far to address this problem, which mainly has to do with the emission of fossil fuels.

What has blocked the necessary action? To answer this question we need to look at the specific ways in which the capital accumulation process has

placed barriers in front of the main international diplomatic effort—the Kyoto Protocol—aimed at slowing down and arresting the global warming trend.

The Failure of the Kyoto Protocol

International efforts to control greenhouse gas emissions began in the early 1990s. These early attempts to create a climate accord produced the United Nations Framework Convention for Climate Change (UNFCCC) agreed upon in 1992. The UNFCCC consisted of voluntary emission targets on the part of states. The failure of states to reduce emissions under this regime led to further negotiations resulting in the adoption of the Kyoto Protocol in 1997, which for the first time established “legally binding” reductions in greenhouse gas emissions of 5.2 percent below 1990 levels, by 2008–2012, for all industrialized countries. The European Union (EU) under this agreement was required to reduce its greenhouse gas emissions by 8 percent below 1990 levels, the United States by 7 percent, and Japan by 6 percent. In line with a prior agreement in the climate negotiations (known as the Berlin Mandate) developing countries, including China, although parties to the agreement, were to remain out of this initial stage in emission reductions.

Subsequent negotiations on the implementation of the Kyoto Protocol from 1997 to 2001 focused mainly on two sticking points: provisions for tradable emission permits, which would allow countries to comply with emission reductions by purchasing emission permits from countries that did not need them, and inclusion of allowances for “carbon sinks,” which would provide emission credits for forests and farmlands. The European Union resisted both proposals as thinly veiled attempts to disguise real failures to meet the emission reduction targets. Support for these measures came from the United States, Japan, Canada, Australia, and New Zealand. Negotiations broke down at the Hague in November 2000, when both sides refused to give in on this dispute. In March 2001, with these issues still unresolved and with no major industrial country yet having ratified the agreement, the Bush administration declared that the Kyoto Protocol was “fatally flawed” and announced that it was unilaterally pulling out of the climate accord.

Nevertheless, negotiations designed to prepare the way for ratification of the Kyoto Protocol went forward in July 2001 in Bonn. For the treaty to come into force it had to be ratified by countries accounting for 55 percent of global greenhouse gas emissions. This meant that without U.S. participation,

eventual ratification by Japan, Canada, and Australia was essential. Under these circumstances, the European Union was forced to give way on point after point in the negotiations—adopting the very positions that the United States (along with Japan, Canada, Australia, and New Zealand) had previously advanced at the Hague.

Although the Kyoto Protocol was kept alive in Bonn, despite the exit of the United States, it was shot full of holes, belying the targeted reductions in emissions. Farmlands and forests were to be treated as carbon sinks, resulting in credits in emission reduction. In effect, countries would be counted as having “reduced emissions” simply for watching their trees grow. Tradable pollution permits were to be allowed, enabling countries like Japan, Canada, and Australia, which had increased their greenhouse emissions substantially since 1990, to purchase emission permits from countries like Russia that, due to the collapse of the Soviet Union and most of its industrial structure, had experienced dramatic declines in emissions since 1990. The sole penalty for failing to meet emission reduction targets would be that a country’s targets in the next round would be increased by a certain percentage. Proposals to institute reparations for damage to the climate, to be paid by those countries that did not meet the targeted reductions, were dropped. In a major concession to Japan, the “legally binding” character of the original agreement was also dropped in favor of language that said the accord was “politically binding.” The very thing that had distinguished the Kyoto Protocol from the original UNFCCC—the establishment of “legally binding” reductions in emissions—was thus abandoned.

The refusal of the United States, which alone accounts for a quarter of the world’s greenhouse gas emissions, to remain a party to the climate accord was the most glaring failure of the agreement arrived at in Bonn. On June 11, 2001, President George W. Bush delivered a speech that strongly reiterated the policy, adopted in March by his administration, of refusing to back the Kyoto Protocol. In doing so, he made more definite a U.S. position already evident during the Clinton administration—when all action to obtain U.S. ratification of the climate treaty had come to a halt in the face of the opposition of the U.S. auto-industrial complex (which meant that there was zero support for ratification of the accord within the U.S. Senate).

What made Bush’s reiteration of U.S. opposition to the climate accord in June 2001 so revealing was how he dealt with a report from the prestigious National Academy of Sciences (NAS). The administration had previously insisted on the need for further research into climate change, and

had called upon the NAS to examine the present state of climate science (specifically the research results of the U.N. Intergovernmental Panel on Climate Change [IPCC]) and deliver a report to the administration.

Searching desperately for some kind of scientific rationale for its claim that an international accord to combat global warming was unwarranted, the Bush administration had written to the NAS: "The administration is conducting a review of U.S. policy on climate change. We seek the Academy's assistance in identifying the areas in the science of climate change where there are the greatest certainties and uncertainties. We would also like your views on whether there are any substantive differences between the IPCC Reports and the IPCC summaries. We would appreciate a response as soon as possible."

The Bush administration had thus called upon the NAS to determine whether the IPCC, whose reports were written by the top climate scientists in the world, had somehow created a politically determined set of conclusions not merited by the underlying science—or worse still, that the science had been politically tampered with, as the Global Climate Coalition (the main lobbying organization for corporations opposed to the Kyoto Protocol) had been arguing.

Days before Bush's June 11, 2001, speech the NAS had delivered its report, *Climate Change Science: An Analysis of Some Key Questions*, to the president, strongly reconfirming what the IPCC in its various reports had already established, that global warming as a result of human activities is a reality and a growing threat to the stability of the biosphere and thus to life on earth as we know it. On all of this, the NAS left no room for doubt, declaring in the very first paragraph:

Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability. Human-induced warming and associated sea level rises are expected to continue through the 21st century. Secondary effects are suggested by computer model simulations and basic physical reasoning. These include increases in rainfall rates and increased susceptibility of semi-arid regions to drought. The impacts of these changes will be critically dependent on the magnitude of the warming and the rate with which it occurs.

The NAS not only supported the IPCC reports, but also indicated that the IPCC's Summary for Policy Makers had not distorted the underlying scien-

tific findings; that no modifications in the scientific text of any significance had been made following the meetings of the lead authors with governmental representatives; and that those minor changes made were documented and included with the consent of the convening lead authors. All claims that the IPCC process had been politically tampered with were therefore false.

The NAS report on *Climate Change Science* left the Bush administration with no alternative but to admit to the seriousness of the problem, or be seen as having turned its back on science altogether. Thus President Bush in his June speech acknowledged the existence of significant global warming arising from carbon dioxide emissions along with other greenhouse gases, and conceded that “the National Academy of Sciences indicates that the increase is due in large part to human activity.” He went on, however, to point out that there were many uncertainties in the specific projections on climate change and their effects, and in technological prospects for reducing the buildup of greenhouse gasses in the atmosphere. The Kyoto Protocol itself, he said, was flawed for two reasons: (1) it “would have a negative economic impact [on the U.S. economy] with layoffs of workers and price increases for consumers”; and (2) it did not include developing countries like China and India, both of which are among the largest contributors to global warming.

The Kyoto Protocol, with its mandatory cutbacks in greenhouse gas emissions, was clearly beyond what U.S. capital and its state were willing to accept. With no scientific basis for rejecting the climate accord, the U.S. government was forced to admit the true nature of its objection: that in its view the cost to the U.S. economy of cutting such emissions, and particularly emissions of carbon dioxide, the leading greenhouse gas, was simply too high a price to pay.

But why was the United States so reluctant to agree to reduce greenhouse gas (particularly carbon dioxide) emissions to below the 1990 level, while Europe seemed more than willing to support the Kyoto Protocol? Was the refusal to go along with the climate accord a peculiarity of the United States—its corporations and government—rather than reflecting conditions endemic to capitalism itself?

Here it is useful to look at the record of carbon dioxide emissions from the burning of fossil fuels for the United States, the European Union and Japan over the 1990s (see Figure 1). In April 1993 President Clinton declared that the United States would stabilize its greenhouse gas emissions at 1990 levels by the year 2000 by relying on an array of volun-

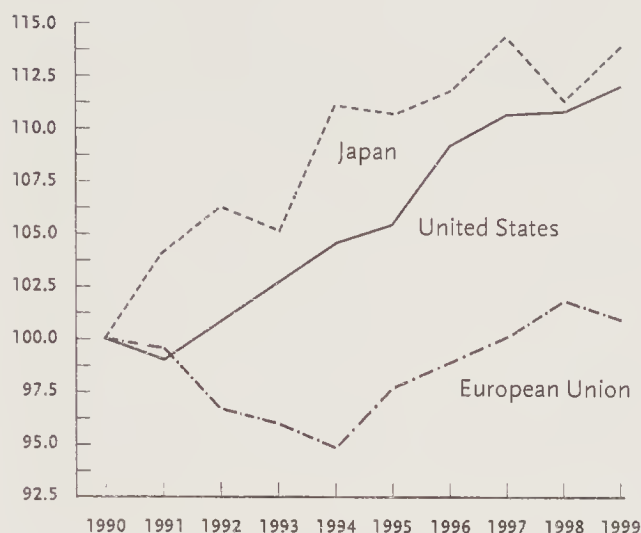


FIGURE 1—Changes in Carbon Dioxide Emissions During the 1990s (1990=100)

SOURCE: U.S. Department of Energy, Energy Information Administration, International Energy Annual, "World Carbon Dioxide Emissions from the Consumption and Flaring of Fossil Fuels," Table H1, <<http://www.eia.doe.gov/emeu/iea/tableh1.html>>.

tary measures. Instead, during the 1990s U.S. carbon dioxide emissions from the combustion and flaring of fossil fuels increased by 12 percent from 1,355 million metric tons of carbon equivalent (MMTCE) in 1990 to 1,520 in 1999. (Carbon dioxide emissions from fossil fuel use currently account for 82 percent of total U.S. greenhouse gas emissions.) During the same period, Japan's carbon dioxide emissions from fossil fuel use rose by 14 percent, from 269 MMTCE to 307. In contrast, EU emissions rose over the 1990s by only 1 percent from 904 MMTCE to 913.¹ The European Union's maintenance of levels of carbon dioxide emissions only slightly above that of 1990 had mainly to do with the shift away from high-carbon coal sources in both Germany (following reunification) and in the United Kingdom (as a result of natural gas made available by discoveries in the North Sea)—producing a sharp decline in carbon emissions in those two countries in the early 1990s, but not a continuing downward trend thereafter. The vast majority of EU member countries, however, had significantly increased their carbon dioxide emissions from fossil fuels over the period. These circumstances led to the European Union's "bubble proposal" in the Kyoto negotiations, whereby the countries of the European Union would not be held to the Kyoto reductions on a country-by-country basis, but would all be contained within the EU bubble.

The dramatic increase in carbon emissions of the United States and Japan, together with the European Union's failure thus far to get below the 1990 level of emissions (and the increasing emissions of most of its member states), tells an important story. For the Kyoto Protocol, 1990 is the "year zero." The clock is ticking and the task of getting to the zero-year

level of emissions (much less below that level) by 2012 appears ever less likely—for the United States in particular. In July 2000 the chief climate negotiator for the United States under the Clinton administration, Frank Loy, declared that the United States would have to reduce its emissions by “up to 30 percent” by 2010 in order to meet the Kyoto target. Japan and Canada are in similar circumstances.

Some idea of the forces at work can be seen by looking at Table 1, showing carbon dioxide emissions per capita from the consumption of fossil fuels by various countries. The United States currently produces 5.6 tons of carbon dioxide emissions from fossil fuel use per person per year. Germany produces half that level per capita. France, which relies heavily on nuclear energy, emits 1.8 tons per capita. Overall the leading capitalist countries (the G–7, as they were called until Russia was invited to join them as part of the G–8) emit 3.8 tons of carbon dioxide per capita per year. In comparison the entire rest of the world emits only 0.7 tons of carbon dioxide from fossil fuel use per person per year. The reason for this large gap in the emissions between the leading industrial countries and the rest of the world is obvious. According to the World Bank, the industrial economies consume around four times as much energy per capita (measured in barrel of oil equivalent) than do the underdeveloped economies (*World Development Report*, 1992, p. 115).

TABLE 1 A World View of Carbon Dioxide Emissions Per Person in Population

Country	Metric Tons of Emissions* (millions)	Population** (millions)	Tons of Emissions (Per Person)
TOTAL G-7 NATIONS	2,590	684	3.8
UNITED STATES	1,520	270	5.6
CANADA	151	30	5.0
GERMANY	230	82	2.8
UNITED KINGDOM	152	59	2.6
JAPAN	307	126	2.4
ITALY	121	58	2.1
FRANCE	109	59	1.8
THE REST OF THE WORLD	3,554	5,213	0.7
WORLD TOTAL	6,144	5,897	1.0

* Millions of metric tons of carbon equivalent of Carbon Dioxide Emissions from the consumption and flaring of fossil fuels. Data are for 1999. ** In 1998.

SOURCES: See Figure 1 (pg 17) for source of emissions data; for population figures see World Bank, “2000 World Development Indicators,” Table 1.1, <www.worldbank.org/data/wdi2001>.

As economic growth occurs in carbon-based capitalist economies the demand for fossil fuels rises as well. Mere increased energy efficiency—as opposed to the actual development of alternative forms of energy—is unable to do much to arrest this process in the face of increasing demand. Insofar as increased efficiency reduces unit energy costs, it tends to lead to increased demand. High demand for fossil fuel use is also encouraged by the high profits to be obtained from this, inducing capital to structure the energy economy around fossil fuels (a reality that is now deeply entrenched). In the United States the Bush administration's push for coal-fired power plants in response to the California energy crisis, plus its withdrawal from the Kyoto Protocol, played a part in the doubling of U.S. coal prices in just six months (*New York Times Magazine*, July 22, 2001, pp. 31–34).

The degree to which a carbon-based economy is endemic to advanced capitalism can be seen in the failure of the Clinton administration to keep carbon dioxide emissions from steadily rising; in Japan's growing emissions over the 1990s despite the stagnation of its economy; and in the European Union's inability to prevent most of its member states from increasing their greenhouse gas emissions. It is also evident in the Bush administration's *National Energy Policy: Report of the National Policy Development Group* (headed by Vice President Dick Cheney) for 2001, which was meant to justify the administration's call for 1,300 additional power plants to meet projected energy needs. This national energy policy advocated by the Bush administration includes only a very brief reference (six paragraphs in the middle of a lengthy report) to global warming.

In July, the Bush administration signaled its opposition to an international proposal, commissioned by the G-8, to phase out subsidies for fossil fuel while increasing subsidies for nonpolluting energy sources. The U.S. government claims such measures would interfere with the smooth operation of the marketplace, which could more adequately decide the appropriate mix of energy sources. The European Union, for its part, decided in July 2001 not to phase out its own subsidies for coal, as previously scheduled for July 2002, but to continue these subsidies for another decade (*Economist*, July 28, 2001).

The great irony behind the failure of the Kyoto Protocol is that it represented, even in its original conception, only a very modest, symbolic first step in arresting the global warming trend. Although aimed at a stabilization of greenhouse gas emissions of industrial countries at around 5 percent below the 1990 level, it fell far short of the massive cuts in emissions

that world climate scientists have repeatedly insisted would be necessary in order to stave off global warming. According to the *London Times* (July 9, 2001), "Not even the treaty's most ardent advocates contend that it is enough to contain global warming. Several models suggest that its impact by 2100 will be a temperature increase of just 0.15 °C less than would occur if nothing is done. Jerry Mahlman, of the U.S. National Oceanic and Atmospheric Administration, says another 30 similar treaties might be required to reduce greenhouse emissions by the 60 to 70 per cent that would make an appreciable difference to the climate."

Determined to oppose emission reductions even as modest as the Kyoto Protocol, Washington, along with some of the major oil companies, has turned to exotic research in carbon sequestration technology as a long-run solution to the problem—one that would supposedly allow such emissions to increase, while protecting the environment. "We all believe technology offers great promise to significantly reduce emissions," Bush declared in June 2001, "especially carbon capture, storage and sequestration technologies." The U.S. government is thus putting tens of millions of dollars, through the Department of Energy, into research into such technologies. These technologies are aimed at: (1) pulling carbon dioxide out of the air; and (2) injecting it back into the coal mines and oil fields from whence it came or into the oceans.

William Nordhaus, the foremost establishment economic analyst of global warming, and his coauthor Joseph Boyer, argue, predictably, in *Warming the World* (2000), that "the Kyoto Protocol has no grounding in economics or environmental policy." Nordhaus and Boyer recommend that the enormous costs to private industry, associated with a global emissions reduction regime, not be taken on too rashly, and advocate instead further research into what they call a prospective "costless" technology: "geoengineering," which would "include injecting particles into the atmosphere to increase the backscattering of sunlight and stimulating absorption of carbon in the oceans" (pp. 126–27).

All of the hoped-for carbon capture and sequestration technologies are designed to get around the emissions problem, allowing the carbon-based economy to continue as before unchanged. None of these technologies are remotely practical at present and may never be. Research ideas currently receiving government and corporate funding, discussed in *Discover* magazine (August 2001), involve the search for something on the order of a "giant absorbent strip, coated with any of the many chemicals that react with

carbon dioxide, that could pull the gas from the air as it passes by,” coupled with fleets of ships pulling two-mile-long pipes that will pump chilled, pressurized carbon dioxide deep into the oceans. In other words, proposals are under consideration that involve a scale of operation that might well dwarf the star wars defense system, both in magnitude and sheer folly. All of them raise major environmental considerations of their own. The fact that such research is being funded and given serious consideration demonstrates that, for the advanced capitalist economies, emission reductions as a solution to global warming are much less desirable than sci-fi technological solutions that will allow us simply to reroute such waste. The solution being proposed via sequestration technology is to dump the excess carbon dioxide elsewhere—in the oceans instead of the atmosphere. The use of the ocean as the final destination for the wastes of the human economy was an issue that already concerned Rachel Carson in the 1950s and 60s.

From any rational perspective, greenhouse gas emission reductions on a level far more aggressive than what was envisioned by the Kyoto Protocol are now needed to address global warming. The IPCC Working Group I concluded in its 2001 report that “there is new and strong evidence that most of the warming observed over the last fifty years is attributable to human activities.” In place of the IPCC’s earlier estimate of an increase in temperature by 1.0–3.5 °C (1.8–6.3 °F) in this century, they now estimate an increase of 1.5–6.0 °C (2.7–10.8 °F). If this increase (even in the middle range) comes true, the earth’s environment will be so radically changed that cataclysmic results will undoubtedly manifest themselves worldwide. These will surely include increased desertification in arid regions and heavier rainfall and risks of floods in other regions; serious damage to crops in the tropics and eventually in temperate areas as well; rising sea levels (due to the melting of glaciers) that will submerge islands and delta regions; damage to ecosystems; and loss of both species and genetic diversity. On top of all of this, there will be increased risks to human health. As always the most exploited areas of the world and their inhabitants will prove most vulnerable.

Yet, no matter how urgent it is for life on the planet as a whole that greenhouse gas buildup in the atmosphere be stopped, the failure of the Kyoto Protocol significantly to address this problem suggests that capitalism is unable to reverse course—that is, to move from a structure of industry and accumulation that has proven to be in the long run (and in many respects in the short run as well) environmentally disastrous. When set against the get-rich-quick imperatives of capital accumulation, the

biosphere scarcely weighs in the balance. The emphasis on profits to be obtained from fossil fuel consumption and from a form of development geared to the auto-industrial complex largely overrides longer-term issues associated with global warming—even if this threatens, within just a few generations, the planet itself.

The Myth of Dematerialization

This harsh conclusion regarding capitalism's inherent anti-environmental character, drawn from the case of global warming, stands in stark contrast to the views of those who in recent years have advanced the notion that capitalism is not a threat to but rather contains within itself the solution to global environmental problems. Among mainstream environmental economists the idea that there is a natural trend toward a "dematerialization" of the capitalist economy has recently emerged as the chief answer to all environmental problems. The dematerialization hypothesis suggests that capitalism is moving toward a "weightless society." Increased energy efficiency and the growth of the New Economy in the advanced capitalist economies are supposedly "decoupling" economic growth from the use of energy and materials and from waste flows into the environment, reducing the environmental impact of each additional monetary increment of GDP. In this view, nothing really need be done to decrease the effects of economic expansion on the environment, because constant capitalist innovation and the wonders of the market are already solving the problem. At best public policy needs simply to accelerate the trend toward dematerialization and to ensure that the environment is "integrated within a more knowledge-driven, innovative economy" (Charles Leadbeater, *The Weightless Society*, p. 177). As stated in the World Bank's *World Development Report 1992* (written on the theme of "Development and the Environment"), "in many cases [in the OECD] economic growth is being 'delinked' from pollution as environmentally non-damaging practices are incorporated into the capital stock" (p. 40). This hypothesis is often portrayed in terms of an "environmental Kuznets curve," an inverted U-shaped curve, applicable to advanced capitalist economies, which are said to be decreasing their physical inputs per unit of GDP after having reached a peak in this respect in the mid- to late twentieth century.²

In reality, however, such "decoupling" has mainly occurred with respect to those pollutants that are easily addressed through end-of-the-pipe solu-

tions. Although there have been reductions in the ratio of material outflow (measured in tons) to GDP, waste flows per capita in the rich countries have nonetheless risen measurably. Moreover, the “throughput” (or quantity used) of materials and energy and the material output dumped into the environment have continued to increase appreciably in absolute terms—as shown by the study *The Weight of Nations: Material Outflows from Industrial Economies* (World Resources Institute, 2000), covering the cases of Austria, Germany, Japan, the Netherlands and the United States.³ “Actual dematerialization,” that report stresses, “has not been achieved” (p. 19). “Fossil fuel combustion is the dominant activity of modern industrial economies and is the single largest contributor to material outflows to the air and on land” (p. 41). The atmosphere remains the main dumping ground for the waste outflows of industrial countries. Carbon dioxide emissions, which by themselves represent eighty percent by weight of Domestic Processed Output (DPO) of industrialized countries, rose in all countries studied except Germany (an exception due, as we have seen, to the effects of reunification and the reduction of high-carbon coal production). “We have learned,” *The Weight of Nations* emphasizes, “that efficiency gains brought by technology and new management practices have been offset by [increases in] the scale of economic growth” (p. 35).

Such results obviously call into question the dominant notion that dematerialization is a natural outgrowth of capitalism. In truth, the mere fact of decoupling, in the sense of decreased energy and materials inputs per increment of GDP, is *nothing new*. The industrial revolution was accompanied by continuous technological improvements. Each new steam engine was more efficient than the one before. “Raw materials-savings processes,” environmental sociologist Stephen Bunker has written, “are older than the Industrial revolution, and they have been dynamic through the history of capitalism.” Any notion that the reduction in physical input per unit of GDP is a recent development is thus “profoundly ahistorical.”⁴

Yet, increased efficiency in the use of physical inputs has been invariably accompanied throughout the history of industrial capitalism by expansion in the scale of the economy (and by more intensive industrialization), and hence widening environmental degradation. Further, the growth of monopoly capitalism has encouraged the production of waste of all kinds, through the proliferation of commodities with little or no use value. One half to three quarters of annual physical inputs to industrial economies are returned to the environment as waste flow within a single

year. The promise of dematerialization as a natural byproduct of "post-industrial" or capitalism is thus a dangerous myth.

If all of this were not simply enough, such physical measures do not deal with the qualitative aspects of output—the environmental effects specific to a particular form of physical throughput. Outflows that are toxic or potentially hazardous increased by nearly 30 percent in the United States between 1975 and 1996 (*The Weight of Nations*, p. 34).

The Gods of Profit vs. the Environment

"The modern world," Rachel Carson observed in 1963, "worships the gods of speed and quantity, and of the quick and easy profit, and out of this idolatry monstrous evils have arisen." The reduction of nature to factory-like forms of organization in the interest of rapid economic returns, she argued, lies behind our worst ecological problems (*Lost Woods*, pp. 194–95). Such realities are, however, denied by the vested interests who continue to argue that it is possible to continue as before only on a larger scale, with economics (narrowly conceived) rather than ecology having the last word on the environment in which we live. The depth of the ecological and social crisis of contemporary civilization, the need for a radical reorganization of production in order to create a more sustainable and just world, is invariably downplayed by the ruling elements of society, who regularly portray those convinced of the necessity of meaningful ecological and social change as so many "Cassandras" who are blind to the real improvements in the quality of life that everywhere surround us. Industry too fosters such an attitude of complacency, while at the same time assiduously advertising itself as socially responsible and environmentally benign. Science, which all too often is prey to corporate influence, is frequently turned against its own precepts and used to defend the indefensible—for example, through risk management analysis.

It was in defiance of such distortions within the reigning ideology, reaching down into science itself, that Rachel Carson felt compelled to ask, in her 1962 Women's National Press Club speech:

Is industry becoming a screen through which facts must be filtered, so that the hard, uncomfortable truths are kept back and only the harmless morsels allowed to filter through? I know that many thoughtful scientists are deeply disturbed that the organizations are becoming fronts for industry. More than one scientist has raised a disturbing question—whether a spirit of Lysenkoism may be developing in America today—the

philosophy that perverted and destroyed the science of genetics in Russia and even infiltrated all of that nation's agricultural sciences. But here the tailoring, the screening of basic truth, is done, not to suit a party line, but to accommodate to the short-term gain, to serve the gods of profit and production (*Lost Woods*, p. 210).

We are constantly invited by those dutifully serving “the gods of profit and production” to turn our attention elsewhere, to downgrade our concerns, and to view the very economic system that has caused the present global degradation of the environment as the solution to the problems it has generated. Hence, to write realistically about the conflict between ecology and capitalism requires, at the present time, a form of intellectual resistance—a ruthless critique of the existing mode of production and the ideology used to support its environmental depredations. We are faced with a stark choice: either reject “the gods of profit” as holding out the solution to our ecological problems, and look instead to a more harmonious coevolution of nature and human society, as an essential element in building a more just and egalitarian social order—or face the natural consequences, an ecological and social crisis that will rapidly spin out of control, with irreversible and devastating consequences for human beings and for those numerous other species with which we are linked.

- 1 These EU figures exclude Luxemburg.
- 2 For a description of the environmental Kuznets curve and its supposed role in the process of “ecological modernization” by a leading advocate of the latter concept, see Arthur, P. J. Mol, *Globalization and Environmental Reform* (Cambridge, MA: MIT Press, 2001), pp. 161–3.
- 3 Although published by the World Resources Institute in Washington, D.C., *The Weight of Nations* is actually the product of a collaborative project of ecological economists to study material flows, carried out by the Department of Social Ecology (headed by Marina Fischer-Kowalski) of the Institute for Interdisciplinary Studies of Austrian Universities, Austria; the Wuppertal Institute, Germany; the Centre of Environmental Science, Leiden University, the Netherlands; the National Institute for Environmental Studies, Japan; and the World Resources Institute, United States. Crucial to this research, as it has evolved in the work of Fischer-Kowalski and her colleagues in Vienna in particular, is the concept of “social metabolism” in analyzing the environmental impact of industrial economies—a general approach that can be traced back to the nineteenth-century work of Justus von Liebig and Karl Marx. See Marina Fischer-Kowalski, “Society’s Metabolism,” in Michael Redclift and Graham Woodgate, eds., *International Handbook of Environmental Sociology* (Northampton, MA: Edward Elgar, 1997), pp. 119–37; John Bellamy Foster, *Marx’s Ecology* (New York: Monthly Review Press, 2000), pp. 141–77.
- 4 Stephen G. Bunker, “Raw Materials and the Global Economy: Oversights and Distortions in Industrial Ecology,” *Society and Natural Resources*, 9: 4 (July–August 1996), p. 421.

2 — The Ecological Tyranny of the Bottom Line

THE ENVIRONMENTAL AND SOCIAL CONSEQUENCES OF ECONOMIC REDUCTIONISM

In recent decades environmentalists have directed a persistent ecological critique at economics, contending that economics has failed to value the natural world. Lately economists have begun to respond to this critique, and a rapidly growing subdiscipline of environmental economics has emerged that is dedicated to placing economic values on nature and integrating the environment more fully into the market system. However, the question arises: Is the cure more dangerous than the disease? Does the attempt to internalize the natural environment within the capitalist market system—without a radical transformation of the latter—lead to a new empire of the economy over ecology, a sort of neocolonialism where the old colonialism is no longer seen as sufficient? And what are the ultimate consequences of this?

Although there are distinguished exceptions, most work in the relatively new field of environmental economics is conducted within the orthodox or neoclassical economic framework.¹ As the British left-green economist Michael Jacobs has written, “At heart, the neoclassical approach to environmental economics has one aim: to turn the environment into a commodity which can be analyzed just like other commodities. . . . If only the environment were given its proper value in economic decision-making, the economist reasons, it would be much more highly protected.” “As far as economists are concerned,” George Eads and Michael Fix likewise observed in a study published by the Urban Institute, “the problems of environmental pollution, excessive levels of workplace hazards, or unsafe consumer products exist largely because ‘commodities’ like environmental pollution, workplace safety, and product safety do not trade in markets.”²

For orthodox economists, ecological degradation is evidence of market failure.³ The market is unable to guide firms in the efficient use of environmental assets if they are not already fully incorporated within the market system by means of a rational price structure. The first task of environmental economists therefore is to transform ecological assets into marketable goods. For example, if clean air is not a marketable good with a price, then the market places no value on it. Thus when an industrial plant emits air pollution, it simply externalizes the cost (which shows up in premature deaths, damage to ecosystems, deterioration of environmental amenities, etc.) to society, while the environmental damage is not internalized within the market or on the balance sheet of the firm. The answer to this, from the standpoint of neoclassical environmental economics, is to create markets in clean air, thereby internalizing such external costs within the market. The overall logic is one of bringing the earth within the balance sheet.⁴

Costing the Earth

Since the environment (that is, the biosphere) is not a commodity, however, and is not reproduced according to the rules of the market, what means are to be adopted in order to internalize the environment within the market system? It is here that most of the attention of environmental economics is directed. Neoclassical environmental economists essentially rely on a three-stage process. First, they break the environment down into specific goods and services, separated out from the biosphere and even from particular ecosystems, in such a way as to make them into commodities (to a degree), for example, the timber available in a particular forest, the water quality in a given river, the species in a particular wildlife reserve, or the maintenance of a certain global temperature over a number of decades. Then these goods and services are given an imputed price through the construction of supply and demand curves, presumably allowing economists to ascertain the optimal level of environmental protection.⁵ Finally, various market mechanisms and policy instruments are devised in order to either change prices in existing markets or to create new markets so as to achieve the desired level of environmental protection.

A great deal of attention is given in this process to the construction of demand curves for environmental goods and services. (The task of constructing supply curves, associated with the costs of environmental protection, is generally considered—perhaps mistakenly—to pose fewer

difficulties than demand curves.) Demand curves are constructed by determining the willingness to pay of consumers. However, since actual markets for environmental goods and services do not for the most part exist—that is, these products are not actually bought—the willingness to pay on the part of consumers is imputed in a couple of ways.

The first of these methods is known as hedonic pricing. In this approach consumer preferences are supposedly revealed through the demand for goods and services that are closely associated with a given environmental product. Such closely associated goods and services, existing within actual markets, are seen as in some way standing in for the environmental product in question, or else offering the basis for comparisons from which calculations regarding the willingness to pay for a given environmental product can be derived. For example, the willingness of consumers to pay for a quiet neighborhood is calculated by comparing the market price of homes near an airport with similar homes in a quieter locale. Or the willingness of people to protect a recreation site can be imputed on the basis of their willingness to pay transportation costs to visit the site.

An example of hedonic pricing in the United States occurs in government attempts to value the environmental assets that would be lost—say in the construction of a dam—by letting the amount that sportsmen (and sportswomen) pay on average in their pursuit of fish and game stand in for the value of these species, which is taken as an indication of the value of a given local ecosystem. This is accomplished through the use of a concept known as wildlife fish user days (WFUD), representing the amount of money that an average individual sportsperson could be expected to spend in 12 hours in pursuit of various forms of wildlife. Waterfowl were valued in the early 1980s at \$19-\$32 per WFUD, elk at \$16-\$25 per WFUD, and fish at \$14-\$21 per WFUD. By this means the market utility associated with the pursuit of fish and game (representing the demand for environmental protection in the area to be flooded) could be compared, within the context of a broader cost-benefit analysis, with the market utility to be derived from (and the willingness of consumers to pay) for a new dam, or some other development project.⁶

Such bottom-line thinking recognizes no boundaries outside of the accounting ledger. A closely related form of cost-benefit analysis has been applied to human beings, in assessing risk within the occupational environment. Under the Reagan administration, the Office of Management and Budget (OMB) attempted to promote calculations of the *dollar value of*

a *human life* based on the *wage premiums* that workers required in order to accept a higher risk of early death. On this basis a number of academic studies concluded that the value of a worker's life in the United States (in the early 1980s) was worth between \$500,000 and \$2 million (far less than the annual salary of many corporate chief executive officers). The OMB then used these results to argue that certain forms of pollution abatement were cost-effective, while others were not, in accordance with President Reagan's Executive Order No. 12291 that regulatory measures should "be chosen to maximize the net benefit to society."⁷

The second major method of determining consumer preferences is what is known as the contingent valuation method. Here hypothetical markets are constructed and consumers are asked to indicate their preferences through surveys. In such surveys representative samples of the population are asked what they would pay for a given level of protection for a given environmental commodity, and at the same time what they would have to be given in compensation for losing it. Ideally, such surveys should cover a large number of levels of protection, generating a whole range of values from consumers. This seldom proves practicable, however, and more often the surveys cover only a few levels of protection—for example, making a river fishable, swimmable, and drinkable. Using the responses of individuals in these surveys, economists aggregate the results across the entire population in order to construct demand curves for the hypothetical environmental commodities.

Having determined the most appropriate (most cost-efficient) level of environmental protection through hedonic pricing and contingent valuation, neoclassical economists move on to the problem of how to alter existing markets or to create new ones in order to achieve the optimal level of protection.⁸ Much of environmental economics thus aims at the creation of markets to solve problems of pollution and environmental degradation. Essentially, there are two market-oriented techniques used.⁹ One is the fairly straightforward imposition of taxes or subsidies that will increase the costs of inflicting environmental damage and the benefits of environmental improvements. The other technique is to use the state to create new markets, which then operate on their own. One example of this is the charging of entrance fees to parks, so as to restrict admission in accordance with ability to pay. Another is changing property rights, such as the creation of exclusive economic zones in coastal waters. Particularly popular among neoclassical environmental economists and policy makers is the

use of the state to establish market-based incentives such as tradable pollution permits. This allows pollution up to a certain overall level while making it possible for firms that are more efficient in reducing pollution to benefit through the sale of these permits—thus forcing those firms that continue to pollute excessively to pay for their pollution.

The entire neoclassical view, it should be clear beyond any doubt at this point, rests on turning the environment into a set of commodities.¹⁰ Further, the goal is quite explicitly one of overcoming the so-called market failures of the environment by constructing replacement markets for environmental products. If environmental degradation and pollution are evident, the economist reasons, it must be because the environment has not been fully incorporated within the market economy, and does not operate according to the laws of economic supply and demand. Yet, the faulty character of neoclassical environmental economics becomes evident when one realizes that this entire methodology is based on the utopian myth that the environment can and should become a part of a self-regulating market system.

Contradictions of Economic Reductionism

Nature, however, is not a commodity produced to be sold on the market according to economic laws of supply and demand. Nor is it a market organized according to laws of individual consumer preferences. It is not even privately owned for the most part. The allocation and distribution of environmental goods is subject to state regulation.

The environment can be rationally considered a “condition of production” for the economy. However, it cannot be fully incorporated into the circular flow of a commodity economy. There are ethical reasons why we may choose to preserve crucial parts of nature from the forces of the market. Moreover, any attempt to allow the “tyranny of the bottom line” guide our relation to nature in its entirety would be disastrous.¹¹

The conditions of environmental reproduction (that is, ecological sustainability) can be undermined not only through the economy failing to take environmental costs into account (the externalization of costs to the environment), as is commonly supposed, but also by the attempted incorporation of the environment into the economy—the commodification of nature. The reason for this is that the underlying problem can be traced neither to the nature of the environment itself nor to market failures (imperfections in the workings of the market system), but rather arises

from the fundamental nature of the socioeconomic system in which we live. In *The Great Transformation*, Karl Polanyi wrote:

What we call land is an element of nature inexplicably interwoven with man's institutions. To isolate it and form a market out of it was perhaps the weirdest of all undertakings of our ancestors. . . . The economic function is but one of many vital functions of land. It invests man's life with stability; it is the site of his habitation; it is a condition of his physical safety; it is the landscape and the seasons. We might as well imagine his being born without hands and feet as carrying on his life without land. And yet to separate land from man and organize society in such a way as to satisfy the requirements of a real estate market was a vital part of the utopian concept of a market economy.¹²

The “weird” nature of such a reductionist approach to nature, arising out of an attempt to construct not only all of society but also the entire ecology of humankind (and indeed ecological relations in general) along market-commodity lines, has its concrete manifestation in three interwoven contradictions. The first is the radical break with all previous human history necessitated by the reduction of the human relation to nature to a set of market-based utilities, rooted in the egoistic preferences of individuals. “For the first time,” Marx wrote of capitalist society, “nature becomes purely an object for humankind, purely a matter of utility; ceases to be recognized as a power for itself; and the theoretical discovery of its autonomous laws appears merely as a ruse so as to subject it under human needs, whether as an object of consumption or as a means of production.”¹³ By reducing the human relation to nature purely to possessive-individual terms, capitalism thus represents (in spite of all of its technological progress) not so much a fuller development of human needs and powers in relation to the powers of nature, as the alienation of nature from society in order to develop a one-sided, egoistic relation to the world.

The second contradiction of economic reductionism when applied to nature is associated with the radical displacement of the very idea of value or worth, resulting from the domination of market values over everything else. This alienation of nature was highlighted by Kant's classic distinction between market price and intrinsic value: “That which is related to general human inclinations and needs has a market price. But that which constitutes the condition under which alone something can be an end in itself does not have mere relative worth (price) but an intrinsic worth (dignity).”¹⁴

It is this widespread humanistic sense of systems of intrinsic value that are not reducible to mere market values and cannot be included within a cost-benefit analysis that so often frustrates the attempts of economists to

carry out contingent value analyses among the general public. If asked whether the market economy should place a value on all of nature, most people would probably say yes, but this really tells us nothing, given that the concept of value in ordinary parlance may often mean something like dignity rather than price. Time and again, when asked to set a price on particular environmental goods such as air quality or a picturesque landscape, large numbers of people will simply refuse—sometimes with the suspicion that such exercises point not to preservation but to something more like a protection racket.¹⁵

For many, probably a majority of people—even in our self-centered, acquisitive society—nature is not something to be broken into pieces and then inserted into a system of relative prices. Viewing nature in terms of individual consumer preferences rather than convictions, duties, aesthetic judgments, etc., is for most people a kind of “category mistake.”¹⁶ As E. F. Schumacher noted in his critique of the application of cost-benefit analysis to the environment in his *Small Is Beautiful*, the attempt “to measure the immeasurable is absurd and constitutes [on the part of the economist] but an elaborate method of moving from preconceived notions to foregone conclusions; all one has to do to obtain the desired results [the reduction of parts of the environment to commodity values] is to impute suitable values to the immeasurable costs and benefits.” What is worst about this undertaking “is the pretence that everything has a price or, in other words, that money is the highest of all values.”¹⁷

The third contradiction of economic reductionism when applied to the environment can be seen in the material consequences, not merely those of a moral nature. Although the internalization of the environment within the economy, by providing commodity prices for everything in nature, and establishing markets (often by artificial means) to solve all problems of pollution, resource exhaustion, etc., is often presented as the way out of our ecological problems, a good case can be made that such solutions, while sometimes attenuating the problems in the short term, only accentuate the contradictions overall, undermining both the conditions of life and the conditions of production. The reason for this is the sheer dynamism of the capitalist commodity economy, which by its very nature accepts no barriers outside of itself, and seeks constantly to increase its sphere of influence without regard to the effects of this on the biosphere. It is not so much the failure to internalize large parts of nature into the economy that is the source of environmental problems, but rather that more and more of

nature is reduced to mere cash nexus and is not treated in accordance with broader, more ecological principles.

For a neoclassical economist, songbird species are facing extinction because their relative prices are too low (that is, they are outside the market). The “natural” solution from this standpoint then is to find a way of bidding up the price of songbirds by creating markets for them. However, finding a way of assigning a higher relative price to songbirds is unlikely to do much good as long as the primary reason for their approaching extinction is expansion of the entire system of contemporary agribusiness, with its disastrous (and frequently poisonous) effect on the habitat on which these birds depend.

Similar issues arise in the case of forest ecosystems, although in this situation it is not a question of being outside the market or lacking a price tag. Forests have long been managed on market-based principles. The result in most cases has been the loss of forests, since the market sees forests, not as ecosystems, but as consisting of so many million or billion board feet of standing timber. According to the rules of accumulation under a system of market values, a relatively untouched, pristine forest (i.e., an intact forest ecosystem supporting diverse species) is a “gift of nature” not yet in a fully managed state, containing trees that may be hundreds of years old and that are no longer growing at a rate that is justified according to the current rate of interest. Such unproductive assets therefore need to be harvested as quickly as possible and replaced by an industrial tree plantation consisting of a single species of tree, with individual trees of uniform age, grown with the help of a massive infusion of industrial chemicals, and harvested and turned into commodities within a few decades. Such monocultures no longer support a diverse range of plant and animal species. In effect, an extreme division (and simplification) of nature has occurred because it has been turned into a commodity. Forest ecosystems are threatened therefore, not by the failure to incorporate them into the market system, but rather by the “natural” operations of the commodity system itself, and by the extreme narrowness of its objectives.¹⁸

From an ecological standpoint, insofar as the diversity of life is an objective, the market is extremely inefficient compared with nature itself. Encountering a tropical forest for the first time, the great nineteenth-century naturalist Alexander von Humboldt remarked that the very density of the forest “enlarged the domains of organic nature.”¹⁹ This principle, central to Darwin’s evolutionary theory, came to be known as the law of divergence—the more diverse forms of life in a given area (the more

ecological niches seized upon), the more that area will support. Yet turning forests into commodities has led to their degradation (i.e., extreme simplification), thereby *diminishing* rather than enlarging the domains of organic nature in this sense.

The Ideology of Natural Capital

Recently, it has become popular among environmental economists—who are well aware of the destructive impact that the commodity economy has had on nature—to argue that the internalization of environmental costs has to be seen in a broader way by recognizing that all of nature and its various components are essentially “natural capital.”²⁰ Such economists present the environmental crisis not so much as a failure of the market as a failure of our accounting system, which does not recognize that capital already includes all of existence.

Green entrepreneur Paul Hawken has popularized the view that true capitalism, as opposed to capitalism as we have known it thus far, would take natural capital into account, and by doing so save the environment. The system of market pricing has failed us with respect to the environment, he writes, “for the most simple and frustrating of reasons: bad accounting. Natural capital has never been placed on the balance sheets of companies, countries or the world. Paraphrasing G. K. Chesterton, it could be fairly said that capitalism might be a good idea except that we have never tried it yet. And try it we must and will, for capitalism cannot be fully attained or practiced until, as any accounting statement will tell us, we have an accurate balance statement.”²¹

Ecological-socialist economist Martin O'Connor has referred to this theoretical tendency critically as the attempted “capitalization of nature,” meaning “the *representation* of the biophysical milieu (nature) and of non-industrialized economies and the human domestic sphere (human nature) as reservoirs of ‘capital,’ and the codification of these stocks as property tradable ‘in the marketplace.’”²²

The proper domain of capital is thus magically enlarged by a mere change of terminology. Formerly, all of nature was treated as a “gift” to capital and as an external and exploitable domain. Now it is increasingly “redefined as itself a stock of capital.” Correspondingly, the nature of capitalism is seen as changing “from accumulation and growth feeding on an external domain to ostensible self-management and conservation of the

system of capitalist nature closing back on itself.”²³ The irony here is that capitalism, in typical fashion, sees any crisis as emanating from barriers to the expansion of capital rather than the expansion of capital itself. The solution is to increase the domain of capital, recognizing that nature too is properly part of the rational system of commodity exchange.

Just as Weber admitted in his *General Economic History* that historically capitalism had been based on rapacious colonialism, but went on to deny that this had anything to do with modern rational capitalism, which no longer relied on force or unequal exchange, so the contemporary environmental economists argue that capitalism historically relied on a rapacious relation to nature, but that a modern rational capitalism—capitalism worthy of the name—is destined to bring all of nature within its balance sheet.²⁴ As Martin O’Connor observes, “if capital is nature and nature is capital, the terms become virtually interchangeable; one is in every respect concerned *with the reproduction of capital, which is synonymous with saving nature*. The planet as a whole is our capital, *which must be sustainably managed*.”²⁵

Yet with all the rhetoric of the valuation of natural capital, the actual operation of the system has not materially changed, and can’t be expected to change. The rhetoric of nature and the planet as capital thus serves mainly to obscure the reality of the extreme exploitation of nature for the sake of commodity exchange. Moreover, the principal result of the incorporation of such natural capital into the capitalist system of commodity production—even if carried out—will be the further subordination of nature to the needs of commodity exchange. There will be no actual net accumulation of natural capital; rather, nature will increasingly be converted into money or abstract exchange, subject to the vicissitudes of Wall Street. “The commodity,” as eco-Marxist economist Elmar Altvater has observed, “is narcissistic; it sees only itself reflected in gold.”²⁶

Today parts of the redwood forest of northern California that are under private management (Pacific Lumber Corp.) are being removed because trees that are centuries old are considered nonproducing assets, and the rules of the market (and Wall Street) demand that they be liquidated and replaced by younger, faster-growing trees, which can be placed in a “fully managed” condition. The tragic fate of these forests—as noted earlier—is not due to their exclusion from the capitalist balance sheet, but rather to their inclusion. The market has no internal mechanism that recognizes that the results of such decisions are irreversible within the normal human time span (it would take many generations to repair the damage, even if the

system would allow such an enormously costly—in terms of market exchange—process of restoration).

The new hegemonic vision of environmental economics thus seeks to extend the domain of capital to all of nature as the means of preserving the latter. “In what we might call the *ecological phase of capital*,” Martin O’Connor critically observes, “the relevant image is no longer of man acting on nature to ‘produce’ value, henceforth appropriated by the capitalist class. Rather, the image is of nature (and human nature) codified as capital incarnate, regenerating itself through time by controlled regimes of investment around the globe, all integrated in a ‘rational calculus of production and exchange,’ through the miracle of a price system extending across space and time. This is nature conceived in the image of capital.”²⁷

Accumulation and the Environment

The principal characteristic of capitalism, which this whole market-utopian notion of the capitalization of nature ignores, is that it is a system of self-expanding value in which accumulation of economic surplus—rooted in exploitation and given the force of law by competition—must occur on an ever-larger scale. At the same time, this represents a narrow form of expansion that dissolves all qualitative relations into quantitative ones, and specifically in monetary or exchange value terms. The general formula for capital (generalized commodity production), as Marx explained, is one of $M-C-M'$, whereby money is exchanged for a commodity (or the means of producing a commodity), which is then sold again for money, but with a profit. This expresses capitalism’s overriding goal: the expansion of money values (M'), not the satisfaction of human needs. The production of commodities (C) is simply the means to that end.

The ceaseless expansion that characterizes such a system is obvious. As the great conservative economist Joseph Schumpeter remarked, “capitalism is a process, stationary capitalism would be a *contradictio in adjecto*.”²⁸ Economists, even environmental economists, rarely deal with the question of the effect that an increasing economic scale resulting from ceaseless economic growth will have on the environment. Most economists treat the economy as if it were suspended in space, not as a subsystem within a larger biosphere. Moreover, many economists who recognize the importance of natural capital nevertheless adopt what is known as the “weak sustainability hypothesis.” According to this hypothesis, increases in the value of

human capital fully compensate for any losses in natural capital, such as forests, fish stocks, and petroleum reserves.

Some ecological economists, however, have countered with what is known as the “strong sustainability hypothesis,” according to which human-made capital cannot always substitute for natural capital, since there is such a thing as critical natural capital, that is, natural capital necessary for the maintenance of the biosphere. Tropical forests, for example, are home to about half the world’s species and are critical in regulating the planet’s climate. Once this is admitted, though, the dream of reducing all of nature to natural capital to be incorporated within the market fades quite quickly. The self-regulating market system has no way of valuing nature on such a scale. Moreover, there is an inherent conflict between the maintenance of ecosystems and the biosphere and the kind of rapid, unbounded economic growth that capitalism represents.²⁹

Indeed, sustainable development envisioned as the “pricing of the planet” (to refer to the title of one recent book) is little more than economic imperialism vis-à-vis nature.³⁰ It tends to avoid two core issues: whether all environmental costs can actually be internalized within the context of a profit-making economy, and how the internalization of such costs can account for the effects of increasing economic scale within a limited biosphere. The difficulty of internalizing all external costs becomes obvious when one considers what it would take to internalize the costs to society and the planet of the automobile-petroleum complex alone, which is degrading our cities, the planetary atmosphere, and human life itself. Indeed, as the great ecological economist K. William Kapp once remarked, “Capitalism must be regarded as an economy of unpaid costs.”³¹ The full internalization of social and environmental costs within the structure of the private market is unthinkable.

To be sure, some advocates of natural capitalism, like Paul Hawken, contend that economic growth itself on whatever scale raises no insurmountable obstacle to the environment. This, however, has to take the form of unconventional growth characterized by the dematerialization of the economy—reductions in the throughput of raw materials and energy per unit of output. Hawken points to the possibility of a 200-mile-per-gallon car and what he calls the “magic carpet” of recycling.³² However, thinking that such technological wonders can resolve the problem not only goes against the basic laws of thermodynamics (specifically the entropy law, which tells us that nothing comes from nothing) but also defies all that we know about the

workings of capitalism itself, where technological change is subordinated to market imperatives. The biggest obstacle to automobiles with greater gas efficiency is posed by the whole automobile-petroleum complex, i.e., the most powerful corporations in the world. At best, as Altvater has noted, "The economic 'internalization' of economic effects is only a stop-gap: it would not, in any imaginable situation, compensate for the way in which natural conditions are altered through the 'throughput' of materials and energy in production, consumption, and even distribution."³³

The Ecological Blinders of Neoclassical Economics

The case of global warming illustrates well the conservative nature of economics when confronted with existing and impending environmental catastrophes. In an attempt to guess the costs of global warming over the next century, the prestigious neoclassical economist William Nordhaus, writing for *Science* magazine in 1992, suggested that the costs would be largely in the agricultural realm, the main market sector to be affected, and came up with a figure of a 1 percent loss in gross national product (GNP).³⁴ When scientists criticized this estimate as being hopelessly naive, Nordhaus admitted in a later article that his guess had not taken into account the effects that heating of the earth would have on nonmarket sectors, i.e., the value of species driven into extinction and wetlands lost with rising sea levels, the costs associated with the creation of environmental refugees, etc. Since these nonmarket costs are hard to measure, Nordhaus had resorted to a limited sampling of the opinions of economists, atmospheric scientists, and ecologists (so-called expert opinion) on what the costs would be.³⁵ What was revealed, not surprisingly, was an immense cultural divide. As the atmospheric scientist Stephen Schneider, one of Nordhaus's critics, summarized the results:

The most striking difference in the [1994 Nordhaus] study was that almost all the conventional economists considered even a radical scenario in which a 6°C warming would unfold by the end of the next century (a scenario I would label as catastrophic, but improbable—maybe only a 10 percent chance of occurring) as not very catastrophic economically. Most conventional economists still thought even this gargantuan climatic change—equivalent to the scale of change from an ice age to an interglacial epoch in a hundred years, rather than thousands of years—would have only a few percent impact on the world economy. In essence, they accept the paradigm that society is almost independent of nature. In their opinion, most natural services associated with current climate can be substituted with relatively little harm to the economy.

On the other hand, the group Nordhaus labeled as natural scientists thought the damage to the economy from the severe climate change scenario would range from a loss in GNP of several percent to 100 percent; the latter expert assigned a 10 percent chance to the virtual destruction of civilization! Nordhaus suggested that the ones who know the most about the economy are optimistic. Schneider countered with the obvious retort that the ones who know the most about the environment are worried.³⁶

On the basis of the estimates of the economic costs of global warming projected by Nordhaus and other economists, such as William Cline, some economists, most notably Lawrence Summers, formerly chief economist of the World Bank and secretary of treasury in the Clinton administration, have argued that there are no strong economic reasons for moving fast on global warming. Indeed, adopting the weak sustainability hypothesis, Summers contended that "we can help our descendants as much by improving infrastructure as by preserving rain forests."³⁷

This failure of economists to understand that human society and the human economy exist within a larger biosphere and that undermining the conditions of life is bound to undermine the conditions of production takes us to the heart of the failure of both neoclassical economics and the self-regulating market system itself. Nature is not a commodity and any attempt to treat it as such and to make it subject to the laws of the self-regulating market is therefore irrational, leading to the overexploitation of the biosphere by failing to reproduce the conditions necessary for its continued existence.

As the scale of the world commodity economy has grown, so have the number and scale of our ecological problems: global warming, destruction of the ozone layer, extinction of species, loss of genetic diversity, the annihilation of tropical rain forests, desertification, the spread of toxic wastes, pollution of oceans, the decline in environmental health, etc. Although these problems are in many ways discrete, they are also interrelated and have their source in the effects of the commodity economy on nature—whether by the externalization of costs or through the internalization of nature into an economy geared to the unlimited growth of capital.

Those arguing from an economic point of view sometimes say that as ecological resources become scarce, the economy will respond by moving toward preservation. Yet such a smooth functional relationship does not exist. As the radical Green Rudolf Bahro wrote, "The rising cost of land has never been able to halt the building up and concretizing over of the

landscape.”³⁸ Nor is it possible to solve the problem by applying what is known as “the polluter pays principle,” whereby costs are inflicted on the individual polluters. Such views deny the systematic and interrelated nature of the problem: Entire industrial complexes are involved, and ultimately it becomes a question of the expansion of the market itself. Ecological reforms within the system, like all other reforms, are limited because the moment they begin to address the fundamental nature of the system itself, they are quickly curtailed by the vested interests.

Beyond the Bottom Line

Ultimately the defense of the environment therefore requires a break with the tyranny of the bottom line and a long revolution (it is hoped not too long given the acceleration of history associated with ecological change) in which other, more diverse values not connected to the bottom line of the money-driven economy have a chance of coming to the fore. What is needed is a system of production organized democratically in accordance with the needs of the direct producers and reflecting an emphasis on the fulfillment of the totality of human needs (extending beyond the Hobbesian individual).³⁹ These have to be understood as connected to the sustainability of nature, i.e., the conditions of life as we know them. Production can be said to be nonalienating only if it promotes the welfare of every individual as the way of promoting the welfare of all, and only if it fulfills the human need for a sustainable, and in that sense nonexploitative, relation to nature.

Since environmental costs under capitalism tend to be externalized while the benefits of avaricious disregard of environmental necessity feed the wealth of the few, environmental depredations lead to struggles for environmental justice. The struggle for material welfare among the great mass of the population, which was once understood mainly in economic terms, is increasingly taking on a wider, more holistic environmental context. Hence, it is the struggle for environmental justice—the struggle over the interrelationship of race, class, gender, and imperial oppression and the depredation of the environment—that is likely to be the defining feature of the twenty-first century. The universalization of a capitalism that knows no bounds is unifying all that seek to exist in defiance of the system. Historic struggles for social justice are becoming united, as never before, with struggles for the preservation of the earth. The solution to the

environmental problem, our own struggles will teach us, lies beyond the bottom line. It is here that the main resources for hope in the twenty-first century are to be found.

- 1 Within the broader field of environmental economics, it has become common to distinguish between those who are “environmental economists” proper (that is, neoclassical environmental economists) and those who adhere to “ecological economics.” The latter are distinguished by their application of thermodynamics (the entropy law) to economics in the tradition of Nicholas Georgescu-Roegen, by their greater emphasis on limits to growth (or the problem of economic scale in relation to the environment), and by their insistence that fundamental transformations in values and institutions are necessary to cope with the deepening ecological crisis. Clearly, most economists working on environmental issues at present are working within the tradition of neoclassical environmental economics, the goal of which is to make current institutions work better, without in any way questioning the fundamental values of the self-regulating market system. Hence, it is with this dominant tradition, and not with “ecological economists,” that this essay is mainly concerned.
- 2 Michael Jacobs, “The Limits to Neoclassicism: Towards an Institutional Environmental Economics,” in *Social Theory and the Environment*, Michael Redclift and Ted Benton, eds. (New York: Routledge, 1994) p. 69; George Eads and Michael Fix, *Relief or Reform?: Reagan’s Regulatory Dilemma* (Washington, D.C.: Urban Institute, 1984) p. 14. The first part of this chapter draws heavily on Jacobs’s admirable critique of neoclassical environmental economics.
- 3 This is stated explicitly by the influential British environmental economist D. W. Pearce, who writes in the opening sentence of his book *Environmental Economics*, “In approaching the subject matter of environmental economics it is important to understand that, with some exceptions, economists have regarded environmental degradation as a particular instance of ‘market failure.’” D. W. Pearce, *Environmental Economics* (New York: Longman, 1976) p. 1.
- 4 See R. Kerry Turner, David Pearce, and Ian Bateman, *Environmental Economics* (Baltimore, Md.: Johns Hopkins Univ. Press, 1993) pp. 75-7.
- 5 See Jacobs, “Limits of Neoclassicism,” pp. 70-1.
- 6 Marilyn Waring, *If Women Counted* (New York: HarperCollins, 1988) p. 267; *National Wildlife* (April/May 1986) p. 12.
- 7 Barry Commoner, *Making Peace with the Planet* (New York: New Press, 1992) pp. 64-6.
- 8 It should be noted, however, that not all neoclassical environmental economists are concerned with such issues as hedonic pricing and contingent evaluation. It is possible to skip the stage of construction of demand curves that indicate consumer preferences and to derive the initial criteria for the level of protection desired through political or scientific means. Logically, all that is required at this stage is the assumption that markets constitute the most efficient way in which to achieve a given level of environmental protection—regardless of how those preferences were derived in the first place.

- 9 These techniques exclude more direct state regulation (or command and control) divorced from the market-oriented approaches preferred by neoclassical environmental economists.
- 10 Jacobs, "Limits of Neoclassicism," p. 74.
- 11 The phrase "tyranny of the bottom line" is taken from Ralph W. Estes. *Tyranny of the Bottom Line: Why Corporations Make Good People Do Bad Things* (San Francisco: Berrett-Koehler, 1996).
- 12 Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 1944) p. 178.
- 13 Karl Marx, *Grundrisse* (New York: Vintage, 1973) pp. 409-10. In referring to the "ruse" whereby the systematic understanding of nature's laws is viewed simply as a means of subjecting nature to human ends, Marx is clearly referring to the well-known maxim of Bacon: "Nature is only overcome by obeying her": Francis Bacon, *Novum Organum* (Chicago: Open Court, 1994), pp. 29, 43.
- 14 Immanuel Kant, *Foundations of the Metaphysics of Morals* (Upper Saddle River, N.J.: Prentice-Hall, 1995) pp. 51-2.
- 15 Mark Sagoff, *The Economy of the Earth* (New York: Cambridge Univ. Press, 1988) p. 88.
- 16 *Ibid.*, pp. 92-4.
- 17 E. F. Schumacher, *Small Is Beautiful* (New York: Harper & Row, 1973) p. 46.
- 18 The consequences of this process can be seen in the destruction of the old-growth forest of the Pacific Northwest. See John Bellamy Foster, "The Limits of Environmentalism Without Class: Lessons from the Ancient Forest Struggle in the Pacific Northwest," in this volume.
- 19 Alexander von Humboldt, quoted in Loren Eiseley, *Darwin's Century* (New York: Anchor Books, 1961) p. 183.
- 20 See, for example, Thomas Prugh, *Natural Capital and Human Economic Survival* (Solomons, Md.: International Society for Ecological Economics, 1995). The concept of "natural capital" itself dates back to the ecological economics of the 1850s in the U.S., in the work of such thinkers as George Waring and Henry Carey. See George E. Waring, Jr., "Agricultural Features of the Census of the United States for 1850," *Organization & Environment* 12(3): pp. 305-6.
- 21 Hawken, foreword in Prugh, *Natural Capital*, p. xiv.
- 22 Martin O'Connor, "On the Misadventures of Capitalist Nature," in *Is Capitalism Sustainable?* Martin O'Connor, ed. (New York: Guilford Press, 1994) p. 126.
- 23 *Ibid.*
- 24 Max Weber, *General Economic History* (New Brunswick, N.J.: Transaction, 1981) p. 300.
- 25 O'Connor, "On the Misadventures," pp. 132-3.
- 26 Elmar Altvater, *The Future of the Market* (New York: Verso, 1993) p. 184.
- 27 *Ibid.*, p. 131.
- 28 Joseph Schumpeter, *Essays* (Reading, Mass.: Addison-Wesley, 1951) p. 293.
- 29 On the weak and strong sustainability hypotheses, see Turner et al., *Environmental Economics*, pp. 31, 54-6.
- 30 Peter H. May and Ronaldo Seroa Motta (eds.), *Pricing the Planet* (New York: Columbia Univ. Press, 1996).

- 31 K. William Kapp, *The Social Costs of Private Enterprise* (New York: Schocken Books, 1971) p. 231.
- 32 See Paul Hawken, "Natural Capitalism," *Mother Jones Magazine* (April 1997): pp. 40-53, 59-62; John Bellamy Foster, "Natural Capitalism?" *Dollars & Sense* (May-June 1997): p. 9.
- 33 Altvater, *Future of the Market*, p. 186.
- 34 William Nordhaus, "An Optimal Transition Path for Controlling Greenhouse Gases," *Science* 258 (November 20, 1992): p. 1316.
- 35 William Nordhaus, "Expert Opinion on Climate Change," *American Scientist*, 82(1) (January/February 1994): pp. 45-51.
- 36 Schneider, *Laboratory Earth* (New York: Basic Books, 1997) pp. 133-4.
- 37 Lawrence Summers, *The Economist* (May 30, 1992): p. 65.
- 38 Rudolf Bahro, *Avoiding Social and Ecological Disaster* (Bath: Gateway Books, 1994) p. 50.
- 39 For a discussion of the environmentalist notion of the "acceleration of history" (promoted in particular by the Worldwatch Institute), see John Bellamy Foster, *The Vulnerable Planet* (New York: Monthly Review Press, 1999), pp. 143-9.

3—Global Ecology and the Common Good

Over the course of the twentieth century human population has increased more than threefold and gross world product perhaps twenty-fold. Such expansion has placed increasing pressure on the ecology of the planet. Everywhere we look—in the atmosphere, oceans, watersheds, forests, soil, etc.—it is now clear that rapid ecological decline is setting in.¹

Faced with the frightening reality of global ecological crisis, many are now calling for a moral revolution that would incorporate ecological values into our culture. This demand for a new ecological morality is, I believe, the essence of Green thinking. The kind of moral transformation envisaged is best captured by Aldo Leopold's land ethic, which said, "We abuse land because we regard it as a commodity belonging to us. When we begin to see land as a community to which we belong, we may begin to use it with love and respect." Yet behind most appeals to ecological morality there lies the presumption that we live in a society where the morality of the individual is the key to the morality of society. If people as individuals could simply change their moral stance with respect to nature and alter their behavior in areas such as propagation, consumption, and the conduct of business, all would be well.²

What is all too often overlooked in such calls for moral transformation is the central institutional fact of our society: what might be called the global "treadmill of production." The logic of this treadmill can be broken down into six elements. First, built into this global system, and constituting its central rationale, is the increasing accumulation of wealth by a relatively small section of the population at the top of the social pyramid. Second, there is a long-term movement of workers away from self-employment and into wage jobs that are contingent on the continual expansion of production. Third, the competitive struggle between businesses necessitates on pain of extinction the allocation of accumulated wealth to new, revolutionary technologies that serve to expand production. Fourth, wants are manufactured in a manner

that creates an insatiable hunger for more. Fifth, government becomes increasingly responsible for promoting national economic development, while ensuring some degree of “social security” for at least a portion of its citizens. Sixth, the dominant means of communication and education are part of the treadmill, serving to reinforce its priorities and values.³

A defining trait of the system is that it is a kind of giant squirrel cage. Everyone, or nearly everyone, is part of this treadmill and is unable or unwilling to get off. Investors and managers are driven by the need to accumulate wealth and to expand the scale of their operations in order to prosper within a globally competitive milieu. For the vast majority the commitment to the treadmill is more limited and indirect: they simply need to obtain jobs at livable wages. But to retain those jobs and to maintain a given standard of living in these circumstances it is necessary, like the Red Queen in *Through the Looking Glass*, to run faster and faster in order to stay in the same place.

In such an environment, as the nineteenth-century German philosopher Arthur Schopenhauer once said, “A man can do what he wants. But he can’t want what he wants.” Our wants are conditioned by the kind of society in which we live. Looked at in this way, it is not individuals acting in accordance with their own innate desires, but rather the treadmill of production on which we are all placed that has become the main enemy of the environment.⁴

Clearly, this treadmill leads in a direction that is incompatible with the basic ecological cycles of the planet. A continuous 3 percent average annual rate of growth in industrial production, such as obtained from 1970 to 1990, would mean that world industry would double in size every twenty-five years, grow sixteenfold approximately every century, increase by 250 times every two centuries, 4,000 times every three centuries, etc. Further, the tendency of the present treadmill of production is to expand the throughput of raw materials and energy because the greater this flow, from extraction through the delivery of final products to consumers, the more opportunity there is to realize profits. In order to generate profits, the treadmill relies heavily on energy-intensive, capital-intensive technology, which allows it to economize on labor inputs. Yet increased throughput and more substitution of energy and machines for labor mean a more rapid depletion of high-quality energy sources and other natural resources, and a larger amount of wastes dumped into the environment. It is unlikely therefore that the world could sustain many more doublings of industrial output under the present system without

experiencing a complete ecological catastrophe. Indeed, we are already overshooting certain critical ecological thresholds.⁵

Matters are made worse by the tendency in recent decades to move from “gross insults” to the environment to “microtoxicity.” As synthetic products (like plastic) are substituted for natural ones (like wood and wool), the older pollutants associated with nineteenth-century industrialization are being replaced by more hazardous pollutants such as those resulting from chlorine-related (organochlorine) production—the source of DDT, dioxin, Agent Orange, PCBs, and CFCs. The degree of toxicity associated with a given level of output has thus risen fairly steadily over the last half century.⁶

It would seem, then, that from an environmental perspective we have no choice but to resist the treadmill of production. This resistance must take the form of a far-reaching moral revolution. In order to carry out such a moral transformation we must however confront what the great American sociologist C. Wright Mills called “the higher immorality.” The “higher immorality” for Mills was a “structural immorality” built into the institutions of power in our society—in particular the treadmill of production. “In a civilization so thoroughly business-penetrated as America,” he wrote, money becomes “the one unambiguous marker of success ... the sovereign American value.” Such a society, dominated by the corporate rich with the support of the political power elite, is a society of “organized irresponsibility,” where moral virtue is divorced from success and knowledge from power. Public communication, rather than constituting the basis for the exchange of ideas necessary for the conduct of a democracy, is largely given over to “an astounding volume of propaganda for commodities...addressed more often to the belly or to the groin than to the head or the heart.” The corrupting influence that all of this has on the general public is visible in the loss of the capacity for moral indignation, the growth of cynicism, a drop in political participation, and the emergence of a passive commercially centered existence. In short, the higher immorality spells the annihilation of a meaningful moral and political community.⁷

Manifestations of this higher immorality—in which money divorced from all other considerations has become the supreme reality—are all around us. In 1992 alone U.S. business spent perhaps \$1 trillion on marketing, simply convincing people to consume more and more goods. This exceeded by about \$600 billion the amount spent on education—public and private—at all levels. Under these circumstances we can expect people to grow up with their heads full of information about saleable commodities,

and empty of knowledge about human history, morality, culture, science, and the environment. What is most valued in such a society is the latest style, the most expensive clothing, the finest car. Hence, it is not surprising that more than 93 percent of teenage girls questioned in a survey conducted in the late 1980s indicated that their favorite leisure activity was to go shopping. Not long ago *Fortune* magazine quoted Dee Hock, former head of the Visa bank card operation, as saying, "It's not that people value money more but that they value everything else so much less—not that they are more greedy but that they have no other values to keep greed in check." "Our social life is organized in such a way," German environmentalist Rudolf Bahro has observed,

that even people who work with their hands are more interested in a better car than in the single meal of the slum-dweller on the southern half of the earth or the need of the peasant there for water; or even a concern to expand their own consciousness, for their own self-realization.

Reflecting on the growing use of pesticides in our society, Rachel Carson wrote that this was indicative of "an era dominated by industry, in which the right to make money, at whatever cost to others, is seldom challenged."⁸

Given the nature of the society in which we live, one must therefore be wary of solutions to environmental problems that place too much emphasis on the role of individuals, or too little emphasis on the treadmill of production and the higher immorality that it engenders. To be sure, it is necessary for individuals to struggle to organize their lives so that in their consumption they live more simply and ecologically. But to lay too much stress on this alone is to place too much onus on the individual, while ignoring institutional facts. Alan Durning of the Worldwatch Institute, for example, argues that

we consumers have an ethical obligation to curb our consumption, since it jeopardizes the chances for future generations. Unless we climb down the consumption ladder a few rungs, our grandchildren will inherit a planetary home impoverished by our affluence.

This may seem like simple common sense but it ignores the higher immorality of a society like the United States in which the dominant institutions treat the public as mere consumers to be targeted with all of the techniques of modern marketing. The average adult in the United States watches 21,000 television commercials a year, about 75 percent of which are paid for by the 100 largest corporations. It also ignores the fact that the treadmill of production is rooted not in consumption but in production.

Within the context of this system it is therefore economically naive to think that the problem can be solved simply by getting consumers to refrain from consumption and instead to save and invest their income. To invest means to expand the scale of productive capacity, increasing the size of the treadmill.⁹

Even more questionable are the underlying assumptions of those who seek to stop environmental degradation by appealing not to individuals in general but to the ethics of individuals at the top of the social pyramid and to corporations. Thus in his widely heralded book, *The Ecology of Commerce*, Paul Hawken argues for a new environmental ethic for businesspeople and corporations. After advocating an ambitious program for ecological change, Hawken states, “Nothing written, suggested, or proposed is possible unless business is willing to embrace the world we live within and lead the way.” According to Hawken, “The ultimate purpose of business is not, or should not be, simply to make money. Nor is it merely a system of making and selling things. The promise of business is to increase the general well being of humankind through service, a creative invention and ethical philosophy.”

Thus he goes on to observe that,

If Dupont, Monsanto, and Dow believe they are in the synthetic chemical production business, and cannot change this belief, they and we are in trouble. If they believe they are in business to serve people, to help solve problems, to use and employ the ingenuity of workers to improve the lives of people around them by learning from the nature that gives us life, we have a chance.¹⁰

The central message here is that businesspeople merely have to change the ethical bases of their conduct and all will be well with the environment. Such views underestimate the extent to which the treadmill of production and the higher immorality are built into our society. Ironically, Hawken’s argument places too much responsibility and blame on the individual corporate manager—since he or she too is likely to be a mere cog in the wheel of the system. As the great linguistics theorist and media critic Noam Chomsky has explained,

The chairman of the board will always tell you that he spends his every waking hour laboring so that people will get the best possible products at the cheapest possible price and work in the best possible conditions. But it is an institutional fact, independent of who the chairman of the board is, that he’d better be trying to maximize profit and market share, and if he doesn’t do that, he’s not going to be chairman of the board any more. If he were ever to succumb to the delusions that he expresses, he’d be out.¹¹

To be successful within any sphere in this society generally means that one has thoroughly internalized those values associated with the higher immorality. There is, as economist John Kenneth Galbraith has pointed out, a “culture of contentment” at the top of the social hierarchy: those who benefit most from the existing order have the least desire for change.¹²

Resistance to the treadmill of production therefore has to come mainly from the lower echelons of society, and from social movements rather than individuals. This can only occur, to quote German Green Party leader Petra Kelly, if ecological concerns are “tied to issues of economic justice—the exploitation of the poor by the rich.” Behind every environmental struggle of today there is a struggle over the expansion of the global treadmill—a case of landless workers or villagers who are compelled to destroy nature in order to survive, or of large corporations that seek to expand profits with little concern for the natural and social devastation that they leave in their wake. Ecological development is possible, but only if the economic as well as environmental injustices associated with the treadmill are addressed. An ecological approach to the economy is about having *enough*, not having more. It must have as its first priority *people*, particularly poor people, rather than production or even the environment, stressing the importance of meeting basic needs and long-term security. This is the common morality with which we must combat the higher immorality of the treadmill. Above all we must recognize the old truth, long understood by the romantic and socialist critics of capitalism, that increasing production does not eliminate poverty.¹³

Indeed, the global treadmill is so designed that the poor countries of the world often help finance the rich ones. During the period from 1982 to 1990, the Third World was a “net *exporter* of hard currency to the developed countries, on average \$30 billion per year.” In this same period Third World debtors remitted to their creditors in the wealthy nations an average of almost \$12.5 billion per month in payments on debt alone. This is equal to what the entire Third World spends each month on health and education. It is this system of global inequity that reinforces both overpopulation (since poverty spurs population growth) and the kind of rapacious development associated with the destruction of tropical rain forests in the Third World.¹⁴

For those of you with a pragmatic bent, much of what I have said here may seem too global and too abstract. The essential point that I want to leave you with, however, is the notion that although we are all on the treadmill, we do not all relate to it in the same way and with the same degree of commitment. I have found in my research into the ancient forest struggle in the

Northwest—and others have discovered the same thing in other settings—that ordinary workers have strong environmental values even though they may be at loggerheads with the environmental movement. In essence they are fighting for their lives and livelihoods at a fairly basic level.¹⁵

We must find a way of putting people first *in order to protect the environment*. There are many ways of reducing the economic stakes in environmental destruction on the part of those who have little direct stake in the treadmill itself. But this means taking seriously issues of social and economic inequality as well as environmental destruction. Only by committing itself to what is now called “environmental justice” (combining environmental concerns and social justice) can the environmental movement avoid being cut off from those classes of individuals who are most resistant to the treadmill on social grounds. The alternative is to promote an environmental movement that is very successful in creating parks with “Keep Out!” signs, and yet which is complicit with the larger treadmill of production. By recognizing that it is not people (as individuals and in aggregate) that are enemies of the environment but the historically specific economic and social order in which we live, we can, I believe, find sufficient common ground for a true moral revolution to save the earth.

- 1 James Gustave Speth, “Can the World Be Saved?,” in Anthony B. Wolbarst, *Environment in Peril* (Washington: Smithsonian Institution Press, 1991), pp.64–5.
- 2 Leopold, *The Sand County Almanac* (New York: Oxford University Press, 1949), p. viii.
- 3 The concept of the “treadmill of production” is taken from Allan Schnaiberg, *The Environment: From Surplus to Scarcity* (New York: Oxford University Press, 1980), pp. 205–50, and Schnaiberg and Kenneth Allan Gould, *Environment and Society* (New York: St. Martin’s Press, 1949), p. viii. In Schnaiberg’s earlier work the treadmill is situated in the historical context of monopoly capitalism as described in Paul Baran and Paul Sweezy’s *Monopoly Capital* (New York: Monthly Review Press, 1966) and James O’Connor’s *Fiscal Crisis of the State* (New York: St. Martin’s Press, 1973). It should be noted that the third element of the treadmill listed in the text above—the revolutionization of the means of production on pain of extinction—is attenuated in certain ways under monopoly capitalism, but still remains a general tendency of the system.
- 4 Schopenhauer quoted in Albert Einstein, *Ideas and Opinions* (New York: Dell, 1964), p. 20.
- 5 Chandler Morse, “Environment, Economics and Socialism,” *Monthly Review*, 30: 11 (April 1979): pp. 12–5; Petra K. Kelly, *Thinking Green!* (Berkeley: Parallax Press, 1994), pp. 22–3. The tendency of the system to draw upon ever larger throughputs of raw materials and energy was countered somewhat by increasing energy efficiency (measured by the ratio of GDP to commercial fuels consumed) in the advanced capitalist countries in the 1970s and early 1980s. Since the mid-1980s, however, progress in this respect has slowed as a result of falling energy prices. In the United States, which uses

about as much energy as the entire Third World, energy efficiency has remained essentially unchanged since 1986. See Lester Brown et al., *Vital Signs* 1992 (New York: W.W. Norton, 1992), pp. 54–5, and *Vital Signs* 1994, pp. 126–7.

- 6 Speth, "Can the World Be Saved?," p. 65.
- 7 Mills, *The Power Elite* (New York: Oxford University Press, 1956), pp. 338–61.
- 8 Kevin J. Clancy and Robert S. Shulman, *Across the Board*, October 1993, p. 38; *The Statistical Abstract of the United States*, 1993 (Lanham, MD: Bernan Press, 1993), p. 147; "The Money Society," *Fortune*, 6 July 1987: pp. 26–31; Bahro, *Socialism and Survival* (London: Heretic Books, 1982), p. 31; Carson, "Silent Spring—III," *The New Yorker*, 38: 19 (June 30, 1962): p. 67.
- 9 Durning, *How Much Is Enough?* (New York: W.W. Norton, 1992), pp. 136–7; Jerry Mander, *In the Absence of the Sacred* (San Francisco: Sierra Club Books, 1991), pp. 78–9.
- 10 Hawken, *The Ecology of Commerce* (New York: HarperCollins, 1993), pp. 1–2, 55–6, 216.
- 11 Chomsky interview, Bill Moyers, ed., *A World of Ideas* (New York: Doubleday, 1989), p. 42.
- 12 Galbraith, *The Culture of Contentment* (New York: Houghton Mifflin, 1992).
- 13 Kelly, *Thinking Green!*, p. 25; Ben Jackson, *Poverty and the Planet* (Harmondsworth: Penguin, 1990), pp. 182–3; Raymond Williams, *Resources of Hope* (London: Verso, 1989), p. 221.
- 14 Quotation from Cheryl Payer, *Lent and Lost* (London: Zed Books, 1991), p. 115; also Susan George, "The Debt Boomerang," in Kevin Danaher, ed., *Fifty Years Is Enough* (Boston: South End Press, 1994), p. 29.
- 15 Foster, "The Limits of Environmentalism Without Class," this volume; Thomas Dunk, "Talking about Trees: Environment and Society in Forest Workers' Culture," *The Canadian Review of Sociology and Anthropology*, 31: 1 (February 1994): pp. 14–34.

4—Ecology and Human Freedom

We live at a time when it is reasonable to speak of the possibility of complete ecological destruction, in virtually the same sense that critics of nuclear armaments have often referred to the possibility of complete nuclear destruction. Both human society and the survival of the planet as we know it are now at risk.

Social action to combat this peril, however, has been agonizingly slow. The task of saving the earth is viewed, more often than not, as a costly burden, one which society is willing to support only in very limited ways at present, despite growing evidence of global ecological decline.

To understand why this is so it is necessary, I think, to turn to the dominant conception of human freedom. For centuries our society has seen freedom as a mechanical outgrowth of the technological domination of nature, and of a social arrangement in which each individual is encouraged to pursue his or her own self-interest with no consideration of the larger natural or social repercussions. Environmental protection, it is feared, would set limits both on the freedom of human beings to exploit the earth's resources, and on the freedom of individuals to pursue their own immediate material gain. It raises issues of the quality of life that transcend the quantitative ways in which we have come to judge human progress and freedom. It therefore threatens the very fabric of the possessive-individualist society in which we live.

Our present social order is entrapped in a mechanistic view of human freedom, and of the human relation to nature, that is directly at odds with ecological imperatives. This mechanistic emphasis in our culture dates back to the emergence of the modern scientific worldview, which arose along with the capitalist world economy in the sixteenth and seventeenth centuries. "The modern view," the great physicist David Bohm has argued,

has been that of mechanism. The universe was compared to a gigantic machine, like a clockwork, and later to a structure of atoms. This outlook has gone on to regard the

human being as a machine and is linked to the development of artificial intelligence. Thus, Descartes said that everything was a machine—all animals, the body, etc.

Although highly productive in terms of technological advance, this way of seeing the world has had fateful consequences. “Values,” Bohm observes,

have significance behind them. . . . If the universe signifies mechanism and the values implicit therein, the individuals must fend for themselves. With mechanism, individuals are separate and have to take care of themselves first. We are all pushing against each other and everyone is trying to win. The significance of wholeness is that everything is related internally to everything else, and therefore, in the long run, it has no meaning for people to ignore the needs of others. Similarly, if we regard the world as made up of a lot of little bits, we will try to exploit each bit and we will end up by destroying the planet. At present, we do not adequately realize that we are one whole with the planet and that our whole being and substance comes out of it.¹

Today there is a growing awareness of the ecological threat posed by the prevailing mechanistic worldview and by the idea of the domination of nature that is part of it. Discoveries in such sciences as physics and ecology have undermined Newtonian mechanics, which has not yet however been replaced by any other equivalent worldview. From this has arisen the hope among many that a less mechanistic scientific outlook (some would say an anti-scientific outlook) will eventually provide the answers to the environmental problem.

Yet I think it is essential to recognize that it is not science (that is, the physical and natural sciences) but economics that is the mainspring of the mechanistic outlook that still characterizes our culture. An unwillingness to understand that it is irrational “for individuals to ignore the needs of others” and that the world is not “made up of a lot of little bits” is central to the ruling concept of freedom as free-market individualism.

Indeed, if we were to look for a form of contemporary thought that is wedded to mechanistic and reductionist assumptions with regard to human freedom and nature, we could not do better than to turn to economics. The idea of *homo oeconomicus* is one of atomized, solitary individuals each competing for scarce resources. “The language of physics,” as social ecologist Murray Bookchin tells us,

is appropriate here: society is reduced to a mechanical Brownian movement of molecules, each bouncing against each other in the course of exchanging “goods and services.” There appears to be no social dimension and no development of relations in the traditional sense other than quantitative ones.

Labor and land are viewed as commodities. People are reduced to being producers and consumers. The desire for goods is said to be insatiable. Freedom is narrowed down to the right to choose between competing alternatives. Progress, in this conception, occurs through the increased division of labor and through what has often been called the “conquest,” but might better be termed the “division,” of nature. From this, we are told, the optimal social results for humanity emerge, by means of the invisible hand of the free market.²

The fragmentation of reality associated with economic life is often attributed to innate characteristics of human beings themselves, who are seen as utility-seeking profit-maximizers whose natural propensity is to “truck, barter, and trade.” According to Nicholas Georgescu-Roegen, the leading representative of ecological economics,

the fiction of *homo oeconomicus* . . . strips man's behavior of every cultural propensity, which is tantamount to saying that in his economic life man acts mechanically. . . . However, the mechanistic sin of economic science is much deeper than this criticism implies. . . . The whole truth is that economics, in the way this discipline is generally professed, is mechanistic in the same strong sense in which we generally believe only Classical mechanics to be.³

Classical mechanics places little or no importance on qualitative states. It “knows only locomotion, and locomotion is both reversible and qualityless.” Modern neoclassical economics was deliberately designed by its founders as a purely mechanical science in this crude sense. These founders “succeeded so well with their grand plan,” Georgescu-Roegen continues,

that the conception of the economic process as a mechanical analogue has ever since dominated economic thought completely. In this representation, the economic process neither induces any qualitative change nor is affected by the qualitative change of the environment into which it is anchored. It is an isolated, self-contained and a historical process—a circular flow between production and consumption with no outlets and no inlets, as the elementary textbooks depict it. Economists do speak occasionally of natural resources. Yet the fact remains that, search as one may, in none of the numerous economic models in existence is there a variable standing for nature's perennial contribution.⁴

The extreme version of mechanism that one finds within contemporary mainstream economics is apparent in its complete failure to incorporate as basic a phenomenon as entropy into its understanding of the process of production and reproduction. As a result, economics is incapable of making even the first few steps toward understanding nature's changing qualitative states, upon which the economic world ultimately depends.

This failure of mainstream economic thought to evolve beyond a crude mechanism must ultimately be traced back to the socioeconomic conditions that it reflects. The central institution of social control in the modern world is that of the market. Individuals in our society therefore are seen primarily in terms of their market roles; and the market itself emerges as the dominant so-called “natural” force in society—one that is said to be beyond human control in the sense that it is self-regulating. As the economic anthropologist Karl Polanyi wrote,

A market economy is an economic system controlled, regulated, and directed by markets alone; order in the production of and distribution of goods is entrusted to this self-regulating mechanism. An economy of this kind derives from the expectation that human beings behave in such a way as to achieve maximum money gains.

At best, human beings are relegated by our society to the state of being what the sociologist C. Wright Mills called “cheerful robots.”⁵

In this institutional order, production takes the form of commodities produced for sale on the market. The purely quantitative goal that governs production is increased profits. This occurs by means of competition, investment, and increasing productivity. Economic growth is thus inherent to the system. The proceeds of this growth are divided unevenly among classes of individuals, depending on their relation to production. An increase in share of wealth of a relatively small number of owners and managers is accompanied by the growth of relative poverty among the larger global population. Nature, meanwhile, is exploited absolutely, by a system that accords little or no direct value to natural reproduction. “In the grip of a system that breaks everything down into commodity form,” one environmentalist recently commented, “the earth is violated. The living planet is dismembered, as land becomes real estate, forests become lumber, oceans become fisheries and sinks.”⁶

Yet so central has the market mechanism become within our culture that the dominant perspective on the planetary ecological crisis requires that we accept the notion that a further extension of market relations offers the technical answer to all of our environmental problems. We are frequently told that a reconciliation between economy and environment can be achieved without altering the main features of the economic treadmill on which we are all placed. Profits, competition, ever increasing productivity, economic growth, inequality in economic rewards, high levels of consumption, and an everyday life in which each individual is free to pursue his or her atomistic

self-interest, oblivious to the needs of the larger social and natural communities, will remain the defining traits of a free-market system that is suddenly no longer in conflict with environmental requirements. This is the promise of the idea of “sustainable development” in its dominant formulation.

The fact that this approach to the environment is little more than a further rationalization of the process of mechanistic exploitation that endangered the environment and relegated human beings to the status of “cheerful robots” in the first place, can be seen by examining the ideas of one of the most influential advocates of sustainable development within the world business community, billionaire Swiss industrialist Stephen Schmidheiny, chairman of the Business Council for Sustainable Development. The membership of the council includes top officers of such key multinationals as: Chevron Oil, Volkswagen, Mitsubishi, Nissan, Nippon Steel, S.C. Johnson & Son, Dow Chemical, Browning-Ferris Industries, ALCOA, DuPont, Royal/Dutch Shell, and others. This organization thus represents a cross-section of the largest global corporations. Its views are outlined in Schmidheiny’s book *Changing Course*, which was unveiled in time to influence the 1992 Rio Earth Summit.

Five distinct points are stressed in *Changing Course*. First, it is argued that the free market is the best instrument available for combating environmental problems, and that sustainable development depends on the further freeing-up of the market mechanism. If there is a cause of environmental degradation, it lies not in the self-regulating market itself but in governments and the social choices forced on governments by populations. “The use, exploitation, and degradation of nature,” Schmidheiny writes, “has not created signals of scarcity [that is, appropriate prices for natural resources] because those who ‘own’ nature and its services—society, expressing its wishes and intentions through government—have tended to give away environmental resources and services for free.” If markets have failed to take into account the full costs associated with environmental degradation, it is argued, this is mainly because governments and populations have intervened to create what are called “market imperfections.”

Second, environmental costs like pollution have generally been treated by businesses as externalities, i.e., costs that do not fall on the businesses themselves but on society at large. Sustainable development, Schmidheiny tells us, demands that such external costs be internalized to some extent by firms: the “Polluter Pays Principle . . . states that polluters should bear the full costs of any damage caused by the production of goods and services.” These costs

should be passed on to the consumer in the form of higher prices, forcing consumers to seek cleaner substitutes. The real source of environmental damage, in this conception, lies with consumers not business.

Third, it is argued that corporations are learning to develop total quality management, which is extending to such areas as waste reduction and energy efficiency. The internalization of costs is therefore at one with the development of a higher form of market efficiency, already being promoted by the most advanced corporations.

Fourth, at the international level environmental regulations need to be “harmonized” with each other and with the needs of free trade. “Perhaps the most effective way forward,” Schmidheiny argues, “is to improve the ability of GATT [the General Agreement on Tariffs and Trade] to minimize trade interference caused by environmental regulations.”⁷

Fifth, sustainable development is best introduced through the competitive self-regulation of business, with government acting, if at all, in ways that will fine-tune economic instruments in order to provide clearer market signals of economic and environmental scarcity.

This idyllic vision of sustainable development offered by global corporations is rooted in the notion that the market is a smoothly operating mechanism that guarantees economic and environmental efficiency, as long as it is left free from undue interference. There can be little doubt that some marginal improvements in industrial efficiency, particularly in the use of energy, are compatible with the existing system and can lead to greater environmental as well as economic efficiencies. Ecological modernization along these lines will not, however, solve the larger environmental problem—since this derives from a social order committed to capital-intensive, energy-intensive production, the mechanistic exploitation of nature, and ever increasing economic expansion. As Frances Cairncross, environmental editor for the *Economist*, Britain’s leading business magazine, has admitted, “Many people hope that economic growth can be made environmentally benign. It never truly can. Most economic activity involves using up energy and raw materials; that, in turn, creates waste that the planet has to absorb. Green growth is therefore a chimera.” We are far from the social conditions, moreover, where development can occur with only relatively minor impact on the environment.⁸

Even if most of the environmental costs of production could be internalized within the market (which is extremely doubtful, since as the great environmental economist K. William Kapp remarked, “capitalism must be regarded as an economy of unpaid costs”), this would only set the stage for a

more complete human domination of nature. As the philosopher William Leiss has stated, "The trap has been laid, and to subsume the matter of environmental quality under the all-embracing economic calculus is to fall victim to it." Worse still, as long as our socioeconomic order is primarily geared to the accumulation of personal wealth as the means to individual freedom, increased efficiency will only mean a more efficient exploitation of the environment, with disastrous implications for ecosystem survival.⁹

Sustainable development—in the dominant formulation offered by Schmidheiny and others—depends on the privatization of the commons and the assignment of monetary values to parts of the environment that have previously been accorded little or no value—a process that has been termed "costing the earth." This should not, however, be confused with genuine sustainability, which would have to be concerned with the reproduction of entire ecosystems. To attach a monetary value to a part of nature—for example, to freshwater fish independent of the river in which they live—is to assume erroneously that everything can be broken down into individual parts, which can simply be aggregated. As the economic geographer David Harvey has observed, "This way of pursuing monetary valuations tends to break down . . . when we view the environment as being constructed organically, ecosystemically, or dialectically rather than as a Cartesian machine with replaceable parts."¹⁰

Hence, the irony in turning to the economics of sustainable development—in its dominant formulation—for a solution to the environmental problem is that it continues to see human freedom and progress as synonymous with the instrumentalist organization of human beings as self-serving, possessive-individualists, even though this is the principal source of environmental destruction in our society. As the radical philosopher Max Horkheimer explained, mechanistic, class-based society has chosen a path whereby the "domination of nature involves the domination of man":

Economic and social forces take on the character of blind natural powers that man, in order to preserve himself, must dominate by adjusting to them. As the end result of the process, we have on the one hand the self, the abstract ego emptied of all substance except its attempt to transform everything in heaven and on earth into means for its preservation, and on the other hand an empty nature degraded to mere material, mere stuff to be dominated, without any other purpose than that of this very domination.¹¹

The answer to all of this of course is to abandon the prevailing mechanistic conception of human freedom and to construct a society and a human relation to nature that is based on "freedom in general": not the freedom to

exclude others from a genuine relation to nature and the full development of life's possibilities; but rather the freedom of all to share in life's development as part of an organic community. We must reject a social system that demands the fragmentation of all living things and substitute one that promotes wholeness. If we are to save the planet, the economics of individual greed and the social order erected upon it must give way to broader values and a new set of social arrangements, based on a sense of community with life on earth. How this is to be accomplished is another problem.¹²

- 1 David Bohm, "Science, Spirituality, and the Present World Crisis," *ReVision*, 15: 4, (Spring 1993): pp. 148-9.
- 2 Murray Bookchin, *The Limits of the City* (New York: Harper and Row, 1974), pp. 60-1.
- 3 Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process* (Cambridge, MA: Harvard University Press, 1971), p. 1.
- 4 *Ibid.*, p. 2.
- 5 Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 1944), pp. 67-73, 178; C. Wright Mills, *The Sociological Imagination* (New York: Oxford University Press, 1959), p. 175.
- 6 Andrew Bard Schmockler, *Fool's Gold* (New York: HarperCollins, 1993), p. 176.
- 7 Stephen Schmidheiny, *Changing Course: A Global Business Perspective on Development and the Environment* (Boston: MIT Press, 1992), pp. 14-9, 32-3, 74; Pratap Chatterje and Matthias Finger, *The Earth Brokers* (New York: Routledge, 1994), pp. 115-29.
- 8 Frances Cairncross, *Costing the Earth* (London: The Economist Books, 1991), p. 15.
- 9 William Leiss, *The Domination of Nature* (Boston: Beacon Press, 1974), pp. xiii-xiv; K. William Kapp, *The Social Costs of Private Enterprise* (Cambridge, MA: Harvard University Press, 1971), p. 231.
- 10 David Harvey, "The Nature of Environment," in Ralph Miliband and Leo Panitch, eds., *Socialist Register 1993* (New York: Monthly Review Press, 1993), pp. 6-9. Karl Marx and Frederick Engels wrote: "The 'essence' of the freshwater fish is the water of a river. But the latter ceases to be the 'essence' of the fish and is no longer a suitable medium of existence as soon as the river is made to serve industry, as soon as it is polluted by dyes and other waste products, and navigated by steamboats, or as soon as its water is diverted into canals where simple drainage can deprive the fish of its medium of existence." *The German Ideology* (Moscow: Progress Publishers, 1976), p. 66.
- 11 Max Horkheimer, *The Eclipse of Reason* (New York: Continuum, 1992), pp. 93-7.
- 12 The concept of "freedom in general" is taken from Karl Marx, *On Freedom of the Press and Censorship*, Saul Padover, ed. (New York: McGraw Hill, 1974), p. 46.

5 — “Let Them Eat Pollution”

CAPITALISM AND THE WORLD ENVIRONMENT

On December 12, 1991, Lawrence Summers, chief economist of the World Bank, sent a memorandum to some of his colleagues presenting views on the environment that are doubtless widespread among orthodox economists, reflecting as they do the logic of capital accumulation, but which are seldom offered up for public scrutiny, and then almost never by an economist of Summers’s rank. This memo was later leaked to the British publication, the *Economist*, which published part of it on February 8, 1992, under the title “Let Them Eat Pollution.” The published part of the memo is quoted in full below:

Just between you and me, shouldn’t the World Bank be encouraging *more* migration of the dirty industries to the LDCs [Less Developed Countries]? I can think of three reasons:

- 1) The measurement of the costs of health-impairing pollution depends on the foregone earnings from increased morbidity and mortality. From this point of view a given amount of health-impairing pollution should be done in the country with the lowest cost, which will be the country of the lowest wages. I think the economic logic behind dumping a load of toxic waste in the lowest-wage country is impeccable and we should face up to that.
- 2) The costs of pollution are likely to be non-linear, as the initial increments of pollution will probably have very low cost. I’ve always thought that under-populated countries in Africa are vastly *under*-polluted; their air quality is probably vastly inefficiently low [*sic*] compared to Los Angeles or Mexico City. Only the lamentable facts that so much pollution is generated by non-tradable industries (transport, electrical generation) and that the unit transport costs of solid waste are so high prevent world-welfare-enhancing trade in air pollution and waste.
- 3) The demand for a clean environment for aesthetic and health reasons is likely to have very high income-elasticity. The concern over an agent that causes a one-in-a-million change in the odds of prostate cancer is obviously going to be much higher in a country where people survive to get prostate cancer than in a country where under-five

mortality is 200 per thousand. Also, much of the concern over industrial atmospheric discharge is about visibility-impairing particulates. These discharges may have very little direct health impact. Clearly trade in goods that embody aesthetic pollution concerns could be welfare enhancing. While production is mobile the consumption of pretty air is a non-tradable. The problem with the arguments against all of these proposals for more pollution in LDCs (intrinsic rights to certain goods, moral rights, social concerns, lack of adequate markets, etc.) [is that they] could be turned around and used more or less effectively against every Bank proposal for liberalization.

The World Bank later told the *Economist* that in writing his memo Summers had intended to “provoke debate” among his Bank colleagues, while Summers himself said that he had not meant to advocate “the dumping of untreated toxic wastes near the homes of poor people.” Few acquainted with orthodox economics, however, can doubt that the central arguments utilized in the memo were serious. In the view of the *Economist* itself (February 15, 1992), Summers’s language was objectionable but “his economics was hard to answer.”

Although its general meaning could not be clearer, this entire memo deserves to be summarized and restated in a way that will bring out some of the more subtle implications. First, the lives of individuals in the Third World, judged by “forgone earnings” from illness and death, are worth less—the same logic says frequently hundreds of times less—than that of individuals in the advanced capitalist countries where wages are often hundreds of times higher. The low wage periphery is therefore the proper place in which to dispose of globally produced toxic wastes if the overall economic value of human life is to be maximized worldwide. Second, Third World countries are “vastly *under*-polluted” in the sense that their air pollution levels are “inefficiently low” when compared with highly polluted cities like Los Angeles and Mexico City (where schoolchildren had to be kept home for an entire month in 1989 because of the abysmal air quality). Third, a clean environment can be viewed as a luxury good pursued by rich countries with high life expectancies where higher aesthetic and health standards apply; worldwide costs of production would therefore fall if polluting industries were shifted from the center to the periphery of the world system. Hence, for all of these reasons the World Bank should encourage the migration of polluting industries and toxic wastes to the Third World. Social and humanitarian arguments against such world trade in waste, Summers concludes, can be disregarded since they are the same arguments that are used against all proposals for capitalist development.

It is important to understand that this policy perspective, with the utter contempt that it displays both for the world's poor and the world environment, is by no means an intellectual aberration. As the World Bank's chief economist Summers's role is to help create conditions conducive to world capital accumulation, particularly where the core of the capitalist world system is concerned. Neither the welfare of the majority of the population of the globe nor the ecological fate of the earth—nor even the fate of individual capitalists themselves—can be allowed to stand in the way of this single-minded goal.

Perhaps the most shocking part of the Summers memo is the openly exploitative attitude that it demonstrates toward the world's poor. And yet nothing is more characteristic of bourgeois economics. The *Economist*, which went on to defend Summers's general conclusions about the desirability of the migration of polluting industries to the Third World in subsequent commentaries, nonetheless dismissed Summers's specific references to the valuation of life, as "crass," denying that such exploitative attitudes toward human life are likely to play an explicit role in government policy in free societies. "Few governments," the *Economist* stated in its February 15, 1992, issue, "would care to defend a policy based on differences in valuations among groups—arguing, for instance, that society values an extra year of life for a white collar worker more highly than for a blue-collar worker. Yet this is the counterpart, within a rich country, of what Summers appeared to be suggesting for the Third World." The truth, however, as the *Economist* itself admitted at another point in the same article, is that governments constantly do make decisions—whether in regard to health, education, working conditions, housing, environment, etc.—that are "based on differences in valuations" among classes, whether or not they "care to defend" their policies in this way. Indeed, such differences in valuation, as anyone with the slightest knowledge of history and economics must realize, are at the very core of the capitalist economy and state.

To illustrate this we only need to turn to the United States. The OMB (Office of Management and Budget) under the Reagan administration endeavored to promote calculations of the dollar value of a human life based on "the wage premiums that workers require for accepting jobs with increased risk." On this basis a number of academic studies concluded that the value of a worker's life in the United States is between \$500,000 and \$2 million (far less than the annual salary of many corporate CEOs). The OMB then used these results to argue that some forms of pollution

abatement were cost-effective, while others were not, in accordance with President Reagan's executive order No. 12291 that regulatory measures should "be chosen to maximize the net benefit to society."

Barry Commoner informs us:

Some economists have proposed that the value of a human life should be based on a person's earning power. It then turns out that a woman's life is worth much less than a man's, and that a black's life is worth much less than a white's. Translated into environmental terms, harm is regarded as small if the people at hazard are poor—an approach that could be used to justify locating heavily polluting operations in poor neighborhoods. This is, in fact, only too common a practice. A recent study shows, for example, that most toxic dumps are located near poor black and Hispanic communities.

In 1983 a study by the U.S. General Accounting Office determined that three out of four off-site commercial hazardous waste landfills in the southern states were located in primarily black communities even though blacks represented only 20 percent of the population in the region.¹

Summers's argument for dumping toxic wastes in the Third World is therefore nothing more than a call for the globalization of policies and practices which are already evident in the United States, and which have recently been unearthed in locations throughout the capitalist world. The developed countries ship millions of tons of waste to the Third World each year. In 1987 dioxin-laden industrial ash from Philadelphia was dumped in Guinea and Haiti. In 1988 4,000 tons of PCB-contaminated chemical waste from Italy was found in Nigeria, leaking from thousands of rusting and corroding drums, poisoning both soil and groundwater.² There can be few more blatant examples of the continuing dominance of imperialism over Third World affairs.

This same frame of mind, which sees toxic pollution less as a problem to be overcome than one to be managed in accordance with the logic of the free market, is evident in the approach adopted by orthodox economists to issues as fateful as global warming. Writing in the May 30, 1992, issue of the *Economist*, Summers illustrates this perspective and the general attitude of the World Bank by stating that,

The argument that a moral obligation to future generations demands special treatment of environmental investments is fatuous. We can help our descendants as much by improving infrastructure as by preserving rain forests . . . as much by enlarging our scientific knowledge as by reducing carbon dioxide in the air. . . . The reason why some investments favored by environmentalists fail . . . a [rigorous cost-benefit] test is that their likely effect on living standards is not so great. . . . In the worst-case scenario of

the most pessimistic estimates yet prepared (those of William Cline of the Institute for International Economics), global warming reduces growth over the next two centuries by less than 0.1 percent a year. More should be done: dealing with global warming would not halt economic growth either. But raising the specter of our impoverished grandchildren, if we fail to address global environmental problems, is demagoguery.

The problem with such arguments is that they are based on forms of economic calculation that consistently undervalue natural wealth and underestimate the dependence of the economy on ecological conditions. The rebuilding of infrastructure cannot be equated with preserving the world's tropical rainforests since the loss of the latter would be irrevocable and would mean the extinction of both a majority of the world's species and the world's greatest genetic library. The absurdity of William Cline's attempt to quantify the potential economic damages of "very long-term global warming" up through the year 2300—to which Summers refers—should be apparent to anyone who considers the obvious impossibility of applying economic values to the scale of climatic change anticipated. Thus the Cline estimates are based on a projected rise in global mean temperatures of 10° to 18° C (18° to 32° F) by the year 2300. The cost of this to the U.S. economy, Cline expects us to believe, will be long-term damages equal to 6 to 12 percent of GNP under the best assumptions, 20 percent under the worst.³ All of this is nonsense, however, from an ecological standpoint, since a temperature rise of 4° C would create an earth that was warmer than at any time in the last 40 million years. In the midst of the last ice age the earth was only 5° C colder than it is today. Viewed from this standpoint the question of whether or not long-term damages would equal 6, 12, or 20 percent of GNP must give way to the more rational question of whether human civilization and life itself could persist in the face of such a drastic change in global temperatures.

An even more alarming example of the same general argument was provided, again in the May 30, 1992, issue of the *Economist*, in a special report published in advance of the June 1992 Earth Summit in Rio. After examining estimates on the economic costs and benefits of averting global warming and the political obstacles to change under existing capitalist regimes, the *Economist* declares:

The chances that the climate treaty will significantly change the world's output of fossil fuels over the next century is extremely slender. Does this matter? If the figures . . . for the costs of damage likely to be done by climate change are accurate, then the honest answer is "no." It would be, of course, wise for countries to take the free lunches available to

them . . . and to price their energy sensibly. It might be wise to go some way beyond that point, in the interests of buying insurance against nasty surprises. . . . Beyond that, adapting to climate change, when it happens, is undoubtedly the most rational course, for a number of reasons. Most countries will be richer then, and so better able to afford to build sea walls or develop drought resistant plants. Money that might now be spent on curbing carbon-dioxide output can be invested instead, either in preventing more damaging environmental change (like rapid population growth, the most environmentally harmful trend of all) or in productive assets that will generate future income to pay for adaptation. Once climate change occurs, it will be clearer—as it now is not—how much needs to be done, and what, and where. Most of the decisions involved in adapting will be taken and paid for by the private sector rather than (as with curbing greenhouse-gas output) by government. Above all, adapting requires no international agreements.⁴

The answer then is "let them build sea walls or develop drought resistant plants." And this in response to "very probable" rises in global mean temperature of 1.5° to 5.0° C (2.7° to 9° F) over the next century if "business as usual" continues, a prospect that scientists all over the world regard as potentially catastrophic for the entire planet!⁵ The threat of heat waves, droughts, floods, and famines suggests the likelihood of incalculable losses in lives, species, ecosystems, and cultures. Nevertheless, for the *Economist* the adaptation of the capital accumulation process and thus world civilization to irreversible global warming once it has taken place and many of its worst effects are evident is easy to contemplate, while any attempt to head off disaster—however defensible in social, moral, and ecological terms—besides being difficult to institute under present-day capitalist regimes, would interfere with the dominance of capital and must therefore be unthinkable.

The wait-and-see attitude promoted by the *Economist* was of course the general stance adopted by the United States (and to a lesser extent Britain) at the Earth Summit. Through its actions in watering down the climate treaty, refusing to sign the biological diversity treaty, and hindering initiatives on weapons of mass destruction and nuclear waste, the United States signaled in no uncertain terms that it was prepared to take on the task of opposing radical forces within the global environmental movement, adding this to its larger role as the leading defender of the capitalist world. According to the U.S. government's position, the concept of "sustainable development" means first and foremost that any environmental goals that can be interpreted as interfering with development must be blocked. Thus in his defense of U.S. intransigence on global environmental issues at the Earth Summit in June George Bush explained, "I think it is important that we take both those words—environment and development—equally seriously. And we do." No

environmental action could therefore be taken, Bush declared, that would jeopardize U.S. economic interests. "I am determined to protect the environment. I am also determined to protect the American taxpayer. The day of the open checkbook is over . . . environmental protection and a growing economy are inseparable." In what was intended not only as a reelection ploy but also a declaration of U.S. priorities where questions of environmental costs and controls were concerned, Bush declared, "For the past half century the United States has been the great engine of global economic growth, and it's going to stay that way" (*Guardian* [London], June 13, 1992).

The consequences of such shortsighted attention to economic growth and profit before all else are of course enormous, since they call into question the survivability of the entire world. It is an inescapable fact that human history is at a turning point, the result of a fundamental change in the relationship between human beings and the environment. The scale at which people transform energy and materials has now reached a level that rivals elemental natural processes. Human society is adding carbon to the atmosphere at a level that is equal to about 7 percent of the natural carbon exchange of atmosphere and oceans. The carbon dioxide content of the atmosphere as a result has grown by a quarter in the last 200 years, with more than half of this increase since 1950. Human beings now use (take or transform) 25 percent of the plant mass fixed by photosynthesis over the entire earth, land and sea, and 40 percent of the photosynthetic product on land. Largely as a result of synthetic fertilizers, humanity fixes about as much nitrogen in the environment as does nature. With human activities now rivaling nature in scale, actions that in the past merely produced local environmental crises now have global implications. Moreover, environmental effects that once seemed simple and trivial, such as increases in carbon dioxide emissions, have now suddenly become threats to the stability of the fundamental ecological cycles of the planet. Destruction of the ozone layer, the greenhouse effect, annihilation of ancient and tropical forests, species extinction, reductions in genetic diversity, production of toxic and radioactive wastes, contamination of water resources, soil depletion, depletion of essential raw materials, desertification, the growth of world population spurred by rising poverty—all represent ominous trends the full impact of which, singly or in combination, is scarcely to be imagined at present. "With the appearance of a continent-sized hole in the Earth's protective ozone layer and the threat of global warming," Barry Commoner has written, "even droughts, floods, and heat waves may become unwitting acts of man."⁶

The sustainability of both human civilization and global life processes depends not on the mere slowing down of these dire trends, but on their reversal.⁷ Nothing in the history of capitalism, however, suggests that the system will be up to such a task. On the contrary there is every indication that the system, left to its own devices, will gravitate toward the "let them eat pollution" stance so clearly enunciated by the chief economist of the World Bank.

Fortunately for the world, however, capitalism has never been allowed to develop for long entirely in accordance with its own logic. Opposition forces always emerge—whether in the form of working class struggles for social betterment or conservation movements dedicated to overcoming environmental depredations—that force the system to moderate its worst tendencies. And to some extent the ensuing reforms can result in lasting, beneficial constraints on the market. What the capitalist class cannot accept, however, are changes that will likely result in the destruction of the system itself. Long before reform movements threaten the accumulation process as a whole, therefore, counter-forces are set in motion by the ruling interests, and the necessary elemental changes are headed off.

And there's the rub. Where radical change is called for little is accomplished within the system and the underlying crisis intensifies over time. Today this is particularly evident in the ecological realm. For the nature of the global environmental crisis is such that the fate of the entire planet and social and ecological issues of enormous complexity are involved, all traceable to the forms of production now prevalent. It is impossible to prevent the world's environmental crisis from getting progressively worse unless root problems of production, distribution, technology, and growth are dealt with on a global scale. And the more that such questions are raised, the more it becomes evident that capitalism is unsustainable—ecologically, economically, politically, and morally—and must be superseded.

- 1 Barry Commoner, *Making Peace with the Planet* (New York: The New Press, 1992), pp. 64–6; Robert Bullard, "The Politics of Race and Pollution: An Interview with Robert Bullard," *Multinational Monitor*, (13:6, June 1992), pp. 21–2.
- 2 Bill Weinberg, *War on the Land* (London: Zed Books, 1991), pp. 37–9; Edward Goldsmith, et. al., *The Imperilled Planet* (Cambridge, MA: MIT Press, 1990), p. 147; Center for Investigative Reporting and Bill Moyers, *Global Dumping Ground* (Cambridge: Lutterworth Press, 1991), pp. 1–2, 12; Third World Network, *Toxic Terror* (Penang, Malaysia: Third World Network, 1989), pp. 8–25.
- 3 William R. Cline, *The Economics of Global Warming* (Washington, D.C.: Institute for International Economics, 1992), pp. 4–6, 55–8, 130–3, 300.

- 4 See also Frances Cairncross, *Costing the Earth* (London: Economist Books, 1991), pp. 30–1, 130–3.
- 5 National Academy of Sciences, *One Earth, One Future* (Washington D.C.: National Academy Press, 1990), pp. 67–71; Helen Caldicott, *If You Love This Planet* (New York: W.W. Norton, 1992), p. 24; Mostafa K. Tolba, *Saving Our Planet* (New York: Chapman and Hall, 1992), pp. 27–8; Intergovernmental Panel on Climate Change, *Climate Change* (New York: Cambridge University Press, 1990), p. xxii.
- 6 IPCC, *Climate Change*, p. xvi; Donella Meadows, et al., *Beyond the Limits* (London: Earthscan, 1992), pp. 65–6; Jim MacNeill, et al., *Beyond Interdependence* (New York: Oxford University Press, 1991), pp. 8–9; Paul R Ehrlich and Anne H. Ehrlich, *Healing the Planet* (New York: Addison-Wesley, 1991), pp. 26–7; Peter M. Vitousek, et al, “Human Appropriation of the Products of Photosynthesis,” *Bioscience* (36: 6: June 1986), pp. 368–73; Commoner, p. 3.
- 7 Paul M. Sweezy, “Capitalism and the Environment,” *Monthly Review* (41: 2: June 1989), p. 6; Meadows, *Beyond the Limits*, p. xv.

6—The Scale of Our Ecological Crisis

One of the problems that has most troubled analysts of global ecological crisis is the question of scale. How momentous is the ecological crisis? Is the survival of the human species in question? What about life in general? Are the basic biogeochemical cycles of the planet vulnerable? Although few now deny that there is such a thing as an environmental crisis, or that it is in some sense global in character, some rational scientists insist that it is wrong to say that life itself, much less the planet, is seriously threatened. Even the mass extinction of species, it is pointed out, has previously occurred in evolutionary history. Critics of environmentalism (often themselves claiming to be environmentalists) have frequently used these rational reservations on the part of scientists to brand the environmental movement as “apocalyptic.”

Lest one conclude that this is simply a political dispute between those on the side of nature and the greater part of humanity, on the one hand, and those who support the ecologically destructive status quo, on the other, it should be emphasized that the same question has been often raised within the left itself—and sometimes by individuals deeply concerned about environmental problems. An example of this is David Harvey’s book, *Justice, Nature and the Geography of Difference* (1996). Harvey devotes considerable space in this work to criticizing my book, *The Vulnerable Planet: A Short Economic History of the Environment* (Monthly Review Press, 1994), for the “apocalyptic” character of its argument. In Harvey’s words,

[T]he postulation of a planetary ecological crisis, the very idea that the planet is somehow “vulnerable” to human action or that we can actually destroy the earth, repeats in negative form the hubristic claims of those who aspire to planetary domination. The subtext is that the earth is somehow fragile and that we need to become caring managers or caring physicians to nurse it back from sickness into health . . . Against this it is crucial to understand that it is materially impossible for us to destroy the planet earth, that the worst we can do is to engage in material transformations of our environment

so as to make life less rather than more comfortable for our own species being, while recognizing that what we do also does have ramifications (both positive and negative) for other living species . . . Politically, the millenarian and apocalyptic proclamation that ecocide is imminent has had a dubious history. It is not a good basis for left politics and it is very vulnerable to the arguments long advanced by [Julian] Simon and now by [Greg] Easterbrook, that conditions of life (as measured, for example, by life expectancy) are better now than they have ever been and that the doomsday scenario of the environmentalists is far-fetched and improbable.¹

Aside from the purely rhetorical flourishes—the use of such terms as “millenarian” and “apocalyptic,” which because of the sense of religious fatalism associated with them imply something irrational in character (the wrath of God, the second coming) that has little to do with the arguments of most environmentalists—this can be taken as a serious criticism not only of *The Vulnerable Planet* but of ideas that have common currency in environmental circles. It is noteworthy that this same criticism, of being “apocalyptic,” has frequently been leveled at such figures as Henry David Thoreau, George Perkins Marsh, Rachel Carson, Paul Ehrlich, and Barry Commoner—indeed at almost all figures who have contributed anything of importance to understanding the modern ecological crisis.²

Naturally, some phrases utilized in the environmental discussion—such as *Silent Spring*, *The Closing Circle*, *Earth in the Balance*, *The End of Nature*, and *The Vulnerable Planet*—are metaphorical, and while pointing to real concerns are not to be taken too literally. When it comes to actual argument, though, most analysts attempt to present an accurate portrayal of the real dimensions of the problem. Thus the opening sentences of *The Vulnerable Planet* convey the exact sense in which the title of that work is to be understood: “Human society has reached a critical threshold in its relation to the environment. The destruction of the planet, in the sense of making it unusable for human purposes, has grown to such an extent that it now threatens the continuation of much of nature, as well as the survival and development of society itself.” It might have been added that the survival of the human species was also in doubt as a result of these very same processes.

Geological Time and Human Time

All of this drives us back to our initial question: What is the proper scale with which to view our environmental crisis? This is an issue that was taken up not too long ago by Stephen Jay Gould in an essay entitled “The Golden Rule: A Proper Scale for Our Environmental Crisis.” Gould begins

his article by acknowledging the reality of some of the facts cited by those who downplay the environmental crisis. Human beings, he argues, are powerless over the earth on a geological time scale (that is, in terms of tens of millions of years):

All the megatonnage in all our nuclear arsenals yields but one ten-thousandth the power of the 10 km asteroid that might have triggered the Cretaceous mass extinction. Yet the earth survived that larger shock and, in wiping out dinosaurs, paved a road for the evolution of large mammals, including humans. We fear global warming, yet even the most radical model yields an earth far cooler than many happy and prosperous times of a prehuman past. We can surely destroy ourselves, and take many other species with us, but we can barely dent bacterial diversity and will surely not remove many million species of insects and mites. On geological scales, our planet will take good care of itself and let time clear the impact of any human malfeasance.

Having said this, however, Gould goes on to suggest that this way of thinking—predicated on a geological time scale—is irrelevant where human time-scales are concerned. “We cannot threaten at geological scales,” Gould writes,

but such vastness has no impact upon us. We have a legitimately parochial interest in our own lives, the happiness and prosperity of our children, the suffering of our fellows. The planet will recover from a nuclear holocaust, but we will be killed and maimed by billions, and our culture will perish. The earth will prosper if polar icecaps melt under a global greenhouse, but most of our major cities, built at sea level as ports and harbors, will founder, and changing agricultural patterns will uproot our populations.³

Our vision in contemporary society is normally limited to our own lifetime and that of a few generations that come before or after us. As a teacher in the realm of social science I know how difficult it is to get students to think in terms of historical time, which often means perceiving things on a scale of centuries or millennia. All of this, however, falls far short of a geological time scale, which exceeds the average life span of most species. In this sense it is reasonable to speak metaphorically of a world in which there is no more spring, or of a “vulnerable planet” when, as Gould says, the threatened reality is one of the elimination of human society and even the human species, along with innumerable “higher” species of direct significance to human beings, as a result of the destruction that humanity is wreaking on its own life support systems. We are definitely speaking parochially: of “our ecological crisis” and not of the demise of the earth or of the biosphere on a geological time scale. Yet behind this concern lies the fact that even the basic biogeochemical processes of the planet—which human beings have come to

see as quite fixed—are “vulnerable” to human transformation in ways that are likely to destroy the planet as a place for human habitation.

None of this of course is meant to deny the reality that, as Gould says, we can “barely dent bacterial diversity and will surely not remove many million of species of insects and mites.” But to say that we cannot claim that the planet or the biosphere is “vulnerable” because such “lower” life forms will survive, or because the biosphere will recover over tens of millions of years is to deny the right of human beings to identify their fate and that of the species with which they are most closely connected with the fate of the planet. It is to insist on a geological way of thinking (the peculiar professional reality of geologists and paleontologists), which though of great scientific importance has little direct relevance for humanity’s own existence. It is as if one were to take the deep ecological viewpoint, which insists that we should view human beings as no more important—even in our own eyes—than any other species, to the level of absolute absurdity of denying that it matters whether we as a species utterly destroy our own moment on earth. It is to deny an essential anthropocentrism without which it is probably impossible for human beings to respond to the ecological crisis on the scale at which we must—that is, in the largest human terms, which identifies our fate with that of the planet.

Comfort or Survival?

Harvey does not stop with a mere rejection of unreasoning “apocalypticism” but goes on to insist that the environmental crisis raises no more serious issue for human beings directly than our own comfort. “The worst that we can do as a result of our environmental depredations,” he says, is “to make life less rather than more comfortable.” To point to anything beyond this, we are told, opens one up to the criticisms of those like Julian Simon and Greg Easterbrook who accuse most environmentalists of being “doomsday prophets.”

To be sure, one should beware of any gross exaggeration of environmental problems. But those sympathetic to the environment should not be lulled by the likes of Simon and Easterbrook—whom Paul and Anne Ehrlich in their *Betrayal of Science and Reason* have dismissed as representatives of the current “brownlash” against environmentalism—into playing down the severity of the ecological crisis.⁴ It has been the world’s natural and physical scientists and not doomsday prophets or the scientifically

uninformed who have been at the forefront in sounding the alarm with regard to global ecological crisis. This can be seen by looking at the “World Scientists’ Warning to Humanity” initiated by the Union of Concerned Scientists and signed in 1992 by 1,575 of the world’s most distinguished scientists, including more than half of all living scientists awarded the Nobel Prize. According to this carefully worded statement, representing the consensus of concerned scientists:

Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at risk the future we wish for human society and the plant and animal kingdom, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring.⁵

The “World Scientists” go on to emphasize that “the environment is suffering critical stress” in such areas as the atmosphere, the oceans, water resources, soil, forests, and living species. “The irreversible loss of species, which by 2100 may reach one-third of all species now living, is especially serious.” Their conclusion is unmistakably clear: “We the undersigned, senior members of the world’s scientific community, hereby warn all humanity of what lies ahead. A great change in our stewardship of the Earth and the life on it is required if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated.”

The main reason that the ecology of the entire planet—as we know it—is now threatened with “irretrievable mutilation” has to do with the rapidly rising rate at which human beings are transforming the earth, on a scale that is now truly planetary in character, rivaling the basic biogeochemical processes of the planet. A few facts are worth noting. Somewhere between a third and a half of the land surface of the earth has been transformed by human action; the carbon dioxide content of the atmosphere has increased by some 30 percent since the industrial revolution; humanity now fixes more atmospheric nitrogen than all natural terrestrial sources combined; more than half of the freshwater sources are now put to use by human beings; 22 percent of marine fisheries are being overexploited (or have already been depleted), while 44 percent are at their limit of exploitation; one-quarter of the earth’s bird species have been driven into extinction by human activities; rates of species extinction are now 100 to 1000 times those that existed prior to the human domination of the earth. In the words of a distinguished team of scientists writing in *Science* magazine: “The

rates, scales, kinds, and combinations of changes occurring now are fundamentally different from those at any other time in history; we are changing the Earth more rapidly than we are understanding it.”⁶

The Unsustainable Development of Capitalism

Yet, the world’s natural and physical scientists, who have done so much to alert us to the dangers facing humanity and the planet as we know it, are ill-equipped to understand the roots of the problem (or even the enormity of the threat looming before us), since they are generally unable to account for the social problems that underlie this ecological crisis, which demand explanations that go beyond such factors as biology, demography, and technology—to address historical forms of production, and particularly capitalism.

Most scientific statements on the environmental crisis end with calls for more careful management. Often, as in the “World Scientists’ Warning,” specific measures are proposed such as reduced dependence on fossil fuels and the substitution of solar energy; cutbacks in consumption; the elimination of world poverty; controls on world population growth; and increased sexual equality for women, including the right to make their own reproductive decisions.

Within the mainstream scientific viewpoint these issues are reduced to questions of individual and collective will—and sometimes to rational choice by means of the market. Since little serious thought is given to the social problem and its relation to ecological sustainability, the views of mainstream environmentalists, including most concerned scientists, as Hans Magnus Enzenberger once pointed out, often smack of a preacher’s sermon in which “the horror of the predicted catastrophe contrasts sharply with the mildness of the admonition with which we are allowed to escape.”⁷

It is only when knowledge of ecological trends is coupled with an understanding of capital accumulation that the full extent of our global ecological crisis is apparent. Capitalism, as many of the world’s greatest economists—both mainstream and radical—have long acknowledged, is a system that can never stand still. If the investment frontier does not expand, and if profits do not increase, the circulation of capital will be interrupted and a crisis will ensue. A “stationary” capitalism is thus an impossibility. As Schumpeter expressed it, “capitalism is a process, stationary capitalism would be a *contradictio in adjecto*.” But at the dawn of the twenty-first century there is every reason to believe that the kind

of rapid economic growth that the system demands in order to sustain its very existence—growth that now occurs within an orbit that encompasses the entire planet—is no longer ecologically sustainable, since it is biased toward high throughputs of materials and energy, which put strains on both the planetary taps (resources) and sinks (the ecosystems that must absorb the resulting waste). All of this is made much worse by the social, economic, and ecological waste resulting from the specific nature and form of capitalist production (going beyond the question of mere quantitative growth).⁸

The fact that there are limitations to the sustainable human intervention into nature—which is a way of saying that human society necessarily coevolves with nature and is not really independent of it—does not mean that all hope of unending human progress should be abandoned or that there cannot be a continuing development of wealth, in the sense of the more complete satisfaction of genuine human needs. But it does mean that the human capacity to promote narrow instrumental gain by means of the “invisible hand” of the market for the benefit of a very few in accordance with the principle “Après moi, le déluge!” inevitably comes up against certain general barriers imposed by nature, as well as more specific social and historical barriers.⁹

The Necessity of Social Control

In 1946 George Orwell wrote an essay entitled “Some Thoughts on the Common Toad.” In that essay he begins by observing tadpoles in a pool, which leads to the argument that spring, like nature in general, is ever resurgent; no matter how oppressive the society nature is ever a haven and a source of “surplus energy.” “So long as you are not actually ill, hungry, frightened or immured in a prison or a holiday camp, spring is still spring. The atom bombs are piling up in the factories, the police are prowling through the cities, the lies are streaming from the loudspeakers, but the earth is still going around the sun, and neither the dictators nor the bureaucrats, deeply as they disapprove of the process, are able to prevent it.” The mere resurgence every year of the spring, Orwell suggested, was a reality that had nothing whatever to do with the fact that “we are all groaning, or at any rate ought to be groaning, under the shackles of the capitalist system” and in that sense it completely lacked “a class angle.” Yet, “if a man cannot enjoy the return of the spring,” Orwell asked, “why should he be happy in a labour-saving Utopia?”¹⁰

Today, a half-century later, Orwell's belief that nature was somehow isolated from the social crisis of capitalism appears almost quaint. About a decade and a half after he authored his essay Rachel Carson wrote her environmental classic, *Silent Spring*, arguing that

Along with the possibility of the extinction of mankind by nuclear war, the central problem of our age has . . . become the contamination of man's total environment with such substances of incredible potential for harm—substances that accumulate in the tissues of plants and animals and even penetrate the germ cells to shatter or alter the very material of heredity upon which the shape of the future depends.¹¹

The source of this tragedy for Carson was that we live in “an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged.”¹² The symbolic representation of this crisis was for her a spring suddenly devoid of songbirds.

Ironically, given Orwell's earlier argument, one of the leading symbols of the “silencing of the spring” today is vanishing frogs and toads. There are some 3,960 species of frogs and toads, the noisiest amphibians. (Herpetologists often refer to both as frogs.) Frogs first emerged 150 to 200 million years ago. Now the growing silence of the spring is deepened by the rapid disappearance of frog species all over the globe—often in areas remote from human contact. In 1990 the world's herpetologists sounded the alarm, making “the vanishing frogs” one of the most widely heralded global ecological catastrophes of the decade. By 1994 a probable cause had been ascertained as a result of a series of experiments conducted in Oregon. UV-B rays, exposure to which is increasing due to the thinning of the ozone layer, was discovered to be killing frog eggs exposed to sunlight. Widely publicized, this phenomenon has become the proverbial canary in the coal mine, announcing to the world that the threat of a “silent spring” is more than ever before us and on a truly global scale.¹³

There is no escaping this global ecological contradiction other than through forms of conscious, rational control that capitalism is inherently incapable of providing. “Freedom in this sphere [the realm of natural necessity],” Marx wrote in *Capital*, “can consist only in this, that socialized man, the associated producers, govern the human metabolism with nature in a rational way, bring it under their collective control instead of being dominated by it as a blind power, accomplishing it with the least expenditure of energy and in conditions most worthy and appropriate for their human nature.” The impairment under capitalism of the metabolic relation

between human beings and the earth (or soil), he argued, created conditions compelling “its systematic restoration as a regulative law of social production, and in a form adequate to the full development of the human race.” Hence, the “conscious and rational treatment of the land as permanent communal property” is “the inalienable condition for the existence and reproduction of the chain of human generations”—what we refer to today as “sustainable development.”¹⁴

There are, as Harvey warns us, dangers in such a call for rational social control of the human relation to nature. Capitalism too insists on the need for social controls—and seeks to bend the process in its own direction. Human “hubris”—insufficiently sensitive to ecological necessity—could create new disasters. All one can say in response is that confronting such problems is what social and ecological revolution is all about. To refuse to engage with the problem is to give up on humanity—and the earth—with at this point quite predictable results.

- 1 David Harvey, *Justice, Nature and the Geography of Difference* (Cambridge, MA: Blackwell, 1996), p. 194.
- 2 The epigraph for Carson’s book was taken from Albert Schweitzer: “Man has lost the capability to foresee and forestall. He will end by destroying the earth.” See the interesting discussion of “environmental apocalypticism” in Laurence Buell, *The Environmental Imagination* (Cambridge, MA: Harvard University Press, 1995), pp. 280–308.
- 3 Stephen Jay Gould, *Eight Little Piggies* (New York: W.W. Norton, 1993), p. 49.
- 4 Paul R. Ehrlich and Anne H. Ehrlich, *Betrayal of Science and Reason: How Anti-Environmental Rhetoric Threatens Our Future* (Washington, D.C.: Island Press, 1996).
- 5 “World Scientists’ Warning to Humanity” in Ehrlich and Ehrlich, *Betrayal of Science and Reason*, pp. 242–50. See also John Bellamy Foster, John Jermier and Paul Shrivastava, “Global Environmental Crisis and Ecosocial Reflection and Inquiry,” *Organization & Environment*, 10: 1 (March 1997), pp. 5–8.
- 6 Peter M. Vitousek, Harold A. Mooney, Jane Lubchenco, and Jerry M. Melillo, “Human Domination of Earth’s Ecosystems,” *Science*, July 25, 1997, pp. 494–9.
- 7 Hans Magnus Enzensberger, “A Critique of Political Ecology,” *New Left Review*, 84 (March–April 1974), p. 26.
- 8 Joseph Schumpeter, *Essays* (Cambridge, MA: Addison-Wesley Press, 1951), p. 293. John Stuart Mill is noteworthy among classical economists for believing that a capitalist economy would eventually terminate in a “stationary state” with little or no growth in population or output, and that this would allow for the development of a more comfortable relation between human beings and nature (as well as an end to class struggle). Insofar as he believed that economic growth would gradually end with no resulting social disruption he greatly underestimated the contradictions built into the laws of motion of capitalism. Today certain ecological economists, such as Herman Daly, see themselves as direct descendants of Mill, arguing for a steady-state market economy as the answer

- to the world's ecological problems. These thinkers are, if anything, more unrealistic in their assessment of capitalism than Mill himself. See John Stuart Mill, *Principles of Political Economy*, Book IV, in Mill, *Collected Works* (Toronto: University of Toronto Press, 1965), pp. 752–7; Herman Daly, *Beyond Growth* (Boston: Beacon Press, 1996).
- 9 Karl Marx, *Capital*, vol. 1 (New York: Vintage, 1976), p. 381. Marx theorized the existence of general barriers to capital attributable to production in general (and to natural conditions) as well as more specific barriers attributable to capital. See Michael Lebowitz, "The General and Specific in Marx's Theory of Crisis," *Studies in Political Economy*, no. 7 (Winter 1982), pp. 5–25.
 - 10 George Orwell, *The Collected Essays, Journalism and Letters* (New York: Harcourt, Brace & World, 1968), pp. 140–5.
 - 11 Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962), p. 8.
 - 12 Ibid., p. 13.
 - 13 Kathryn Phillips, *Tracking the Vanishing Frogs* (New York: St. Martin's Press, 1994).
 - 14 Marx, *Capital* vol. 1, p. 638; *Capital*, vol. 3 (New York: Vintage, 1981), pp. 948–9, 959. See also István Mészáros, *The Necessity of Social Control* (London: Merlin, 1971). Reprinted in Mészáros, *Beyond Capital* (New York: Monthly Review Press, 1995).

7—Sustainable Development of What?

The 1992 Earth Summit in Rio marked a turning point in world history. Faced with the reality of a planetary ecological crisis, all the countries of the world joined in declaring their support for “sustainable development”—or the goal of striking a balance between present development and the potential for future development, the latter requiring some degree of protection of the earth’s resources.

However, the emerging world consensus on the necessity for sustainable development hides more fundamental disagreements. In the view of the dominant interests of society, sustainable development, despite its environmental associations, remains primarily an economic concept serving narrow economic ends. As British economist David Pearce, the author of the British government’s Pearce Report, *Blueprint for a Green Economy*, has stated, “sustainable development . . . [is] fairly simply defined. It is continuously rising, or at least non-declining consumption per capita, or GNP, or whatever the agreed indicator of development is. And this is how sustainable development has come to be interpreted by most economists addressing the issue.”¹

Sustainable development, in these terms, is essentially the same thing as sustained economic growth. This is often made more compatible with ecological considerations by insisting that environmental costs need to be internalized by the market, ensuring that losses in “natural capital,” for example, be accounted for in any computation of growth or development. Also the need to preserve certain specific forms of “critical natural capital,” such as tropical rainforest ecosystems, is sometimes incorporated into this dominant economic approach to sustainable development. Nevertheless, the emphasis throughout remains on sustaining development.

In contrast, for those who are concerned primarily with sustaining the earth and creating livable, sustainable communities, rather than with sustaining development or expanding profits, the conflict between economic

growth and the environment is much more likely to be emphasized. This alternative view starts out by recognizing that most economic activity demands raw materials and energy from the planet and generates waste that the planet must absorb. The environmental consequences of economic growth cannot therefore be avoided (though they might be lessened). A 3 percent annual average rate of growth in world output would mean that world production would double every 23 years; in a single century, it would increase 16 times. Yet, even now there are signs that the world economy is overshooting certain critical ecological thresholds. It is highly unlikely therefore that the planet could long sustain exponential growth of this kind, involving doublings of economic output every quarter century, without experiencing worldwide ecological catastrophe. There is no technological fix that will allow unlimited economic growth within a limited biosphere.

Does this mean that those concerned with the fate of the earth should abandon the goal of economic development altogether? The answer is no. Economic development is still needed in the poorer regions of the world. But more than ever before what is also needed is a critique of development. What kind of development do the people of the world want and need and under what conditions? How is this to be made compatible with the environment? Such questions cannot be answered without a critique of our present form of society. Capitalism, which now dominates every corner of the globe, is in its essence a system of accumulation, geared to the production of capital and profit. As the socialist economist and ecologist James O'Connor has put it, "a capitalist economy based on what Marx called 'simple reproduction' and what many greens call 'maintenance' is a flat impossibility. . . . While there are many variations in economic growth theory, all presuppose that capitalism cannot stand still . . . that it must 'accumulate or die,' in Marx's words."²

In the past, such accumulation has been "subsidized" by a global environment that has been systematically robbed of its natural wealth. The environment has been reduced to a tap from which resources can be extracted and a sink in which wastes (often of a very toxic nature) can be dumped. The history of the last 500 years has therefore been a history of unsustainable development.

A more ecological form of social development is possible but only if the maldevelopment, which now goes under the name of development, is addressed. Such a form is about having enough, not having more. It must

have as its first priority people, particularly poor people, rather than profits or production, and must stress the importance of meeting basic needs and ensuring long term security. Above all, we must recognize the old truth, long understood by both romantic and socialist critics of capitalism, that increasing production does not by itself eliminate poverty.

The main historical sources of the present global ecological crisis lie in what the editor of the Italian edition of *Capitalism, Nature, Socialism*, Giovanna Ricoveri, has aptly called “the mortal conflict between capital and nature.” Yet, it is important to remember that “people are also part of nature, and the exploitation of nature is therefore also the exploitation of some people by other people. Environmental degradation is also the degradation of human relationships.”³ Ecological development is therefore about environmental justice as well. The struggle to create a greener world is linked inseparably to the struggle to reduce social injustice.

The need for an ecological critique of development along these general lines is particularly clear when one turns to South Korea, one country that has come to symbolize for the world at large the miracle of rapid economic growth. Close examination of the Korean experience shows the danger of confusing sustained economic growth with sustainable development. As Kim Chi-ha, a famous environmental activist and chairman of the Korean Environmental Council, has explained, “The myth of limitless economic growth pounded into us by successive governments has devastated our precious land almost to the point where it no longer has the ability to heal.” Air pollution levels in Seoul are among the highest in the world. A study in the 1980s concluded that 67 percent of the rain falling on that city contained levels of acid hazardous to humans. Sulphur dioxide emissions in Seoul have been found to be five times that of Taipei and eight times that of Tokyo, two cities well known for heavy air pollution. In 1989, the government discovered that water at ten purification plants contained heavy metals such as cadmium, iron, and manganese at twice the official tolerance levels. Pesticide use increased by a factor of 26 between 1967 and 1985, making Korean agriculture one of the heaviest consumers of pesticides per hectare in the world; pesticide runoff is a major source of groundwater pollution. According to studies conducted in the mid-1970s, fertilizer use per hectare in Korean agriculture was 6 times the U.S. level and 13 times the world level. By 1990, Korea was relying on nuclear power for more than half of its electrical energy generation, and was the most nuclear power-dependent country in the world. Korea has one of the highest rates

of occupation-related illnesses in the world, with 2.66 out every 11 persons suffering from occupation-related illnesses, compared to 0.70 in Taiwan, 0.93 in Singapore, and 0.61 in Japan. Fortunately, these conditions have resulted in the rapid growth of an environmental movement in Korea that has already won some major victories.⁴

Sustained economic development over decades, as the Korean case so clearly shows, is therefore not the same thing as environmentally sustainable development. Still, Korea is far from being one of the worst offenders from a global perspective. The United States alone accounts for about 25 percent of world primary energy demand, about as much as the entire "developing world." Any discussion of the global ecological crisis must therefore concentrate on the excesses of the advanced capitalist states, and their impact on the periphery of the world economy. It is here at the heart of the capitalist world system that the problem of unsustainable development arises in its most acute form. Ecological struggles are therefore connected inseparably to the struggle against imperialism, which takes on new meaning when viewed in terms of the exploitation of the earth's resources.

All of this suggests that we need to create through our struggles a global society that elevates the status of nature and community above that of the accumulation of capital; equality and justice above individual greed; and democracy above the market. A new accord with nature is needed. Above all, we need to rethink the meaning of human progress. Countless people around the world are already engaged in this struggle and many millions more will join them. Nothing less than the fate of the earth as we know it is at stake.

- 1 David Pearce, *Blueprint 3: Measuring Sustainable Development* (London: Earthscan, 1993), p. 8.
- 2 James O'Connor, "Is Sustainable Capitalism Possible?" Martin O'Connor, ed., *Is Capitalism Sustainable?* (New York: Guilford, 1994), p. 159.
- 3 Giovanna Ricoveri, "Culture of the Left and Green Culture," *Capitalism, Nature, Socialism*, 4, 3, September 1993, pp. 116-7.
- 4 Walden Bello and Stephanie Rosenfeld, *Dragons in Distress* (San Francisco: Institute for Food and Development Policy, 1992), pp. 95-112; Martin Hart-Landsberg, *The Rush to Development: Economic Change and Political Struggle in South Korea* (New York: Monthly Review Press, 1993), pp. 265-8; Kim Chi-ha quoted in "Curbing a Pollution Economy," *South*, February 1991, p. 21.

8—Globalization and the Ecological Morality of Place

*A war against the earth. When it's done there'll be no place
A Coyote could hide.*

—GARY SNYDER¹

In U.S. political life in recent years, environmental concerns have become more visible. These concerns are prompted by a variety of feelings: a sense of obligation to future generations, misgivings about the use and abuse of land and wildlife, a feeling that we would be wiser to live within our means with respect to natural resources, and a growing apprehension that damage to the planet's atmosphere and life-fabric may soon be irreversible. While such concerns are welcome, the deeper values of our culture and the workings of our economy often outweigh any moral concerns we may have for the earth and the environment. This makes serious political action on environmental beliefs difficult.

Today's planetary ecological crisis, as such leading environmental thinkers as Raymond Dasmann, Gary Snyder, and Wendell Berry have taught us, can be traced in large part to a loss of a sense of place associated with the rise of tributary civilizations five millennia ago—and even more with the rise of capitalism and the age of colonization five centuries ago. For most of human history, Dasmann explains in his influential study *Environmental Conservation*, society was organized in the form of “ecosystem cultures” in which a given ecosystem, or at most several closely connected ecosystems, formed the conditions for human existence and community. The economies of such ecosystem cultures, he observes, “may have been based on hunting and fishing, and food gathering, or shifting and permanent agriculture, or on nomadic pastoralism, but in all cases their ways of life involved a close and intricate relationship between culture and nature.”

In contrast to ecosystem cultures, rooted in natural regions and watersheds, what Dasmann calls “biosphere cultures” emerged when ancient tributary societies such as Mesopotamia and Rome took over entire regions, creating world empires that drew on the resources and populations of numerous ecosystems. Their greater access to economic surplus and their capacity to exploit the energy and resources of many ecosystems meant that such biosphere cultures were able to disconnect themselves from natural limits to an extent that would have been inconceivable within earlier ecosystem cultures—creating economic networks that extended through large sections of the biosphere.

Indeed, biosphere cultures were characterized from the first by their capacity “to override the ecological controls in any one system and, consequently, to do far greater damage than could be accomplished by a group [or culture] that was totally dependent on a particular ecosystem.” Early biosphere cultures—such as Mesopotamia, Rome, and Mayan civilization—prospered for centuries through their large-scale exploitation of the human and ecological landscape. Ultimately, however, these civilizations experienced decline due in part to the undermining of their own ecological conditions of existence. The destruction of the ecologies of southern Italy and North Africa contributed to Rome’s demise. As J. Donald Hughes concludes in his important work, *Pan’s Travail: Environmental Problems of the Ancient Greeks and Romans*, “environmental factors were significant causes of the decay of Greco-Roman economy and society, though not the only causes, and . . . the most important of these factors were anthropogenic.”² Despite their increased capacity to override natural limits, these tributary societies eventually came up against *regional* ecological limits, and the limits of their ability to appropriate the surplus of others.

Yet with the rise of capitalism and the era of global colonization beginning in the late fifteenth century, a much larger and more destructive biosphere culture emerged. Free from the restraints of any given ecosystem, and even from any given region, the modern capitalist world economy increasingly drew upon the energy and resources of the entire globe, extracting them from the peripheries and drawing them toward the centers of world accumulation. For the first time in human history, the outright “domination of nature” became a systematic principle, institutionalized in all aspects of society, backed up by modern science and technology, and bolstered by the growth in the nineteenth and twentieth centuries of an industrial system of economic expansion. “With the

control of natural forces . . .,” Dasmann writes, “came the possibility of great enrichment, but also of much more complete failure affecting much greater areas of the earth.”³

As Gary Snyder has pointed out, “Dasmann’s concept of ‘biosphere cultures’ helps us realize that biological exploitation is a critical part of imperialism . . . : the species made extinct, the clear-cut forests.” It leads us to the reality of “imperialist civilization with capitalism and institutionalized economic growth.” Such ecological imperialism over the course of just a few centuries has generated what many consider to be a global environmental crisis, placing the ecology of the planet in dire peril. Today, in an age of ever-greater globalization, there is ample reason to believe that the enormous growth in scale of a human economy that pays scant attention to environmental limits will—if nothing is done to alter existing trends—eventually overload much of the biosphere’s capacity to absorb, replenish, and restore within time scales relevant to human species development.⁴

The radical loss of place—the loss of attachment to any part of the earth—associated with the rapidly globalizing capitalist system of today, with its in-built tendency to ecological imperialism, is only made possible by an underlying reductionism that systematically excludes all values—including moral values—except those that serve a few limited instrumental ends (e.g., “the bottom line”), thus dissolving all collective and ecological modes of existence, and with them any sense of inhabiting a particular locale with a particular ecology. As Wendell Berry notes in *The Unsettling of America*, once the “environment” has simply become an area surrounding human beings, it is obvious that we have made “a profound division between it and ourselves.” Indeed, “the first principle of the exploitative mind is divide and conquer.” Reductionism in the treatment of human beings is accompanied by reductionism in the treatment of nature; the detailed division of labor with the detailed division of nature. Agri-culture, in this schema, is more and more reduced to mere agri-business. “In their dealings with the countryside and its people,” Berry writes in *Another Turn of the Crank*,

The promoters of the so-called global economy are following a set of principles that can be stated as follows. They believe that a farm or a forest is or ought to be the same as a factory; that care is only minimally necessary in the use of the land; that affection is not necessary at all; that for all practical purposes a machine is as good as a human; that the industrial standards of production, efficiency, and profitability are the only standards that are necessary; that the topsoil is lifeless and inert; that soil biology is safely

replaceable by soil chemistry; that the nature or ecology of any given place is irrelevant to the use of it; that there is no value in human community or neighborhood; and that technological innovation will produce only benign results.⁵

Out of this exploitative mode of relating to nature and human beings arose what the early twentieth-century American social critic Thorstein Veblen once referred to as the “absentee ownership” of the earth and of sites of production. The growth of ecological imperialism goes hand in hand with the destruction of any sense of the earth as human habitat; “inhabitory peoples” or ecosystem peoples have been displaced by modern population—called by Berry “the vagrant sovereign.”⁶

The Possibility of a Land Ethic

If the foregoing is correct, the conclusion to which we are driven seems inescapable. It is necessary to substitute an ecological culture and an ecological morality for our present immoral or at best amoral approach to the environment. More concretely, it is essential that humanity should learn once again to *inhabit* the earth. Although it is a truism that no living thing and no community willingly fouls its own nest, the division of society and nature has too long led to the illusion that people live only in the sites of consumption, not in the sites of production; and that nature can be treated as external—a region from which resources are drawn and into which wastes are dumped—rather than as an inseparable part, the external body (as Karl Marx once said) of humanity—since we too are a part of nature. It is therefore essential that a new ecological morality—what the great New Deal-era preservationist Aldo Leopold in his classic work *The Sand County Almanac* called a “land ethic”—be substituted for the present forms of use and abuse of the earth.⁷

The general character of such a land ethic is clear. As Leopold wrote, “We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.” In contrast to the dominant forms of Western moral philosophy with their possessive-individualist foundations, Leopold argued that moral sentiments were principally a product of the definition of moral communities—the result of historical and evolutionary development. It was thus necessary to deal with morality historically, as part of an “ethical sequence” that involved the *extension* of ethics to ever wider communities:

All ethics so far evolved from a single premise: that the individual is a member of a community of interdependent parts. . . . The land ethic simply enlarges the boundary of this community to include soils, waters, plants, and animals, or collectively: the land. . . . A land ethic of course cannot prevent the alteration, management and use of these “resources,” but it does affirm their right to continued existence, and, at least in spots, their continued existence in a natural state. In short, a land ethic changes the role of *Homo Sapiens* from conqueror of the land community to plain member and citizen of it. It implies respect for his fellow members, and also respect for the community as such.

Judged in terms of the land ethic, Leopold wrote, “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”

Such moral imperatives of course have a certain vagueness about them, since terms such as “integrity, stability, and beauty” must themselves be defined by human communities in a context of struggle. Nevertheless, Leopold was clear that the current economy founded on the self-interested pursuit of wealth was in a direct conflict with a land ethic that embraced the larger ecological community. “Our bigger-and-better society,” he wrote,

is now like a hypochondriac, so obsessed with its own economic health as to have lost the capacity to remain healthy. The whole world is so greedy for more bathtubs that it has lost the stability necessary to build them, or even to turn off the tap. Nothing could be more salutary at this stage than a little healthy contempt for a plethora of material blessings.

Likewise it was necessary to get away, he argued, from a moral climate in which the land and the environment was simply “a space between cities on which crops grow.”

Yet for all of his insights Leopold—forgetful of the dominance of absentee ownership in his time—argued that the solution lay merely in the growth of an ecological conscience, *particularly among property owners*. “An ethical obligation on the part of the private owner is,” he wrote, “the only visible remedy for these situations.”⁸

Putting the Land Ethic into Practice

Like many advocates of ecological morality Leopold thus stopped short of any analysis of what in the present day must be regarded as the crucial issue: what sociologist C. Wright Mills was later to call “the higher immorality.” In a society run by big money and the tyranny of the corporate bottom line, under the rule of the market, Mills pointed out, “money is the one

unambiguous criterion of success, and such success is still the sovereign American value. . . in relation to which the influence of other values has declined, so men easily become morally ruthless in the pursuit of easy money and fast estate building." This higher immorality, which unabashedly celebrates wealth while commonly ignoring the poverty and environmental destruction generated in its wake, is in fact so institutionalized in society that it hardly appears as immoral at all. Nevertheless all other moral standards and bases of community are forced to give way before it. If land—the essential human connection to the earth—is turned into mere real estate to be bought and sold by the highest bidder, if the commons are enclosed and then exploited outside of any collective restraints, it is due to this reduction of everything to mere economic value. Indeed, the problem, as Marx pointed out long ago, is that in bourgeois society "money . . . becomes the *real community*, since it is the general substance for the survival of all, and at the same time the social product of all." In a society of this kind, people are forced to regard everything about them—the land, the rivers, the natural resources of the earth, as well as their own labor power—as mere commodities, to be exploited for greater gain.⁹

No sustained progress can be achieved with respect to the preservation of the earth as we know it without confronting this higher immorality head-on. Hence today we are seeing the rise throughout the world of an ecological critique of the capitalist world economy (and of all societies that subordinate ecology and human welfare to the treadmill of production), a critique that rests on three propositions: (1) that a system geared to endless exponential growth and the infinite acquisition of riches, no matter how much it rationalizes its use of natural resources, can never be anything but destructive in its relation to the earth, and is in the long run (if not the short run) unsustainable; (2) that a system that disconnects people from all sense of being native to some place and all ecological roots (a phenomenon now carried to extremes with the growing globalization of production) is incompatible with ecological stability and a "land ethic"; and (3) that a system that divides the planet, creating an "ecology of rich and poor," is likewise insupportable. Rejecting the higher immorality, this new ecological conscience says that being green is about having enough, not always more. This does not however mean the abandonment of those populations at the bottom of the world system—for whom genuine economic development, insofar as it benefits the poorest segments of society, remains essential. Indeed, as Tom Athanasiou has remarked in his *Divided Planet*, "History

will judge Greens by whether they stand with the world's poor." Ecology and social justice, as the environmental justice movement of recent years has taught us, cannot be separated.¹⁰

What genuine hope there is for the continuing development of a collective ecological conscience under these circumstances derives ironically from the very globalizing trend of the system and the "acceleration of history" that it has brought with it. Since 1950 the world economy has grown by a factor of five, from \$4 trillion to \$20 trillion. Despite the fact that only 8 percent of the world's population have cars, carbon dioxide emissions, primarily from automobiles, have grown to a level that threatens the stability of the world's climate. Under these circumstances it is obvious to more and more people throughout the world that the entire planet has become vulnerable to the expansion of the most threatening biosphere culture of all, one that now has reached a scale that rivals the basic biochemical cycles of the planet. The manifestations of this are all around us with the advent of such planetary ecological threats as destruction of the ozone layer, global warming, rapid extinction of species, loss of genetic diversity, impending food and water shortages, the proliferation of toxic wastes, and the decline of ecosystems throughout the earth.

The ecological consciousness that this crisis has generated is not merely confined to the global level, however, but is giving rise to an ever more fervent commitment on the part of radical environmentalists to struggle on the behalf of individual ecosystems and the communities attached to them—in opposition to the current world economy, with its "sea of utilitarian brutality" (William Morris). Everywhere the answer—it is being discovered by innumerable ecological activists—is to be found in the defense of diversity, both ecological and cultural, and in the promotion of an ecology of social justice.¹¹

Choice of Cultures—Choice of Ethics

Declining civilizations, Arnold Toynbee once observed, are invariably marked by a "tendency toward standardization and uniformity" and by a loss of "differentiation and diversity." In that respect the current biosphere culture of global capitalism exhibits the main symptoms of decline even as its global empire expands. It is the global expansion of this reductionist system, in fact, that threatens its existence. Problems such as environmental destruction were at one time localized and bounded; they are no longer so.

“If we continue to act on the assumption that the only thing that matters is personal greed and personal gain,” Noam Chomsky has stated, “the [ecological] commons will be destroyed. Other human values have to be expressed if future generations are going to be able to survive.” Indeed, if society continues to be dominated by the narrow ethic of exploitation built into the present political-economic system, it is only a matter of time—a few decades or a few centuries—before the ecology of the planet as a whole will have been so compromised as to undermine the essential means of supporting life as we know it.¹²

There is of course nothing inevitable about such an outcome. “Wherever human beings are concerned,” the great biologist René Dubos once observed, “trend is not destiny.” Everything depends on social struggle and the movements and organizations that people are able to build. What is needed in the current historical conjuncture, as the Worldwatch Institute has declared, is an “environmental revolution” on the scale of the earlier agricultural and industrial revolutions. Such an ecological revolution—if it is to succeed—will need to transcend the present biosphere culture of capitalism and the higher immorality that it engenders, replacing it with a world of ecological and cultural diversity—a world of more complete and universal freedom because rooted in a communal ethic and in accord with the earth and its habitat.¹³

- 1 Gary Snyder, *Turtle Island* (New York: New Directions, 1974), p. 23.
- 2 J. Donald Hughes, *Pan's Travail: Environmental Problems of the Ancient Greeks and Romans* (Baltimore: Johns Hopkins University Press, 1994), p. 182.
- 3 Raymond Dasmann, *Environmental Conservation* (New York: John Wiley and Sons, 1976), pp. 84-5; 410-5.
- 4 Gary Snyder, *A Place in Space* (Washington, D.C.: Counterpoint, 1995), pp. 131, 186-7.
- 5 Wendell Berry, *The Unsettling of America* (San Francisco: Sierra Club Books, 1996) pp. 11, 22; *Another Turn of the Crank* (Washington, D.C.: Counterpoint, 1995), p. 13.
- 6 Thorstein Veblen, *Absentee Ownership* (New York: Augustus M. Kelley, 1923); Berry, *Unsettling*, pp. 53-5; Snyder, *Place in Space*, pp. 183-91.
- 7 Berry, *Unsettling*, p. 51; Karl Marx, *Early Writings* (New York: Vintage, 1975), p. 328.
- 8 Aldo Leopold, *A Sand County Almanac* (NY: Oxford University Press, 1949), pp. viii-ix, 203-4, 214, 224-5.
- 9 C. Wright Mills, *The Power Elite* (New York: Oxford University Press, 1956), p. 346; Karl Marx, *Grundrisse* (New York: Vintage, 1973), pp. 225-6.
- 10 Tom Athanasiou, *Divided Planet: The Ecology of Rich and Poor* (Boston: Little, Brown and Company, 1996), p. 304.

- 11 Lester Brown, et. al., *The State of the World*, 1996 (New York: W. W. Norton, 1996), p. 3; Wolfgang Sachs, "Global Ecology and the Shadow of Development," in Sachs, ed., *Global Ecology* (London: Zed Books, 1993) p. 5; William Morris, "The Socialist Ideal," *European Labour Forum*, Summer 1996, p. 36.
- 12 Arnold Toynbee, *A Study of History*, abridgement of volumes I-IV by D. D. Sommerwell (New York: Oxford University Press, 1947), p. 555; Noam Chomsky (interview) in Bill Moyers, *A World of Ideas*, edited by Betty Sue Flowers (New York: Doubleday, 1989), p. 58; Harry Magdoff and Paul M. Sweezy, "Notes from the Editors," *Monthly Review*, 48: 3 (July-August 1996).
- 13 Lester Brown, et. al., *State of the World*, 1992 (New York: W. W. Norton, 1992). Dubos quoted in A. J. McMichael, *Planetary Overload* (Cambridge University Press), p. 13.

9—Capitalism's Environmental Crisis— Is Technology the Answer?

The standard solution offered to the environmental problem in advanced capitalist economies is to shift technology in a more benign direction: more energy-efficient production, cars that get better mileage, replacement of fossil fuels with solar power, and recycling of resources. Other environmental reforms, such as reductions in population growth and even cuts in consumption, are often advocated as well. The magic bullet of technology, however, is by far the favorite, seeming to hold out the possibility of environmental improvement with the least effect on the smooth working of the capitalist machine. The 1997 International Kyoto Protocol on global warming, designed to limit the greenhouse-gas emissions of nations, has only reinforced this attitude, encouraging many environmental advocates in the United States (including Al Gore in his presidential campaign) to advocate technological improvement in energy efficiency as the main escape from the environmental mess.

There are two ways in which technological change can lower environmental impact. First, it can reduce the materials and energy used per unit of output and, second, it can substitute less harmful technology. Much of the improvement in air quality since the nineteenth century, including its aesthetics, resulted from the reduction in the smoke and sulfur dioxide emissions for which coal burning is notorious. Solar energy, in contrast to other present and prospective sources of energy, is not only available in inexhaustible supply (though limited at any given time and place), but is also ecologically benign. Environmentalists in general therefore prefer a shift to solar energy. Such considerations have encouraged the view that all stops should be pulled out to promote technologies that increase efficiency, particularly of energy, and use more benign productive processes that get rid of the worst pollutants.

I want to concentrate here on the energy efficiency part of this. The issue of the materials used and the production technology are much more intractable problems under the current regime of accumulation. One of the reasons for this is that current productive processes often involve toxins of the worst imaginable kind. For example, we know that the proliferation of synthetic chemicals, many of which are extraordinarily harmful—carcinogenic and teratogenic—is associated with the growth of the petrochemical industry and agribusiness, producing products such as plastics and pesticides. (This was the central message of Barry Commoner's *Closing Circle*.) Yet attempts to overcome this dependence on toxic production create a degree of resistance from the vested interests of the capitalist order that only a revolutionary movement could surmount. In contrast, straightforward improvements in energy efficiency have always been emphasized by capital itself, and fall *theoretically* within the domain of what the system is said to be able to accomplish—even what it prides itself in.

In the past, it was common for environmentalists to compare the problems of the “three worlds” using the well-known environmental impact or “PAT” formula (Population x Affluence x Technology = Environmental Impact). The Third World's environmental problems, according to this dominant perspective, could be seen as arising first and foremost from population growth rather than technology or affluence (given the low level of industrialization). The environmental problems of the Soviet bloc were attributed to its inferior technology, which was less efficient in terms of materials and energy consumed per unit of output, and more toxic in its immediate, localized environmental effects, than in the West. The West's chief environmental problem, in contrast, was attributed neither to its population growth nor its technology (areas in which it had comparative environmental advantages), but to its affluence and the growing burden that this imposed on the environment. The ace in the hole for the wealthy capitalist countries was always seen to be their technological prowess—which would allow them to promote environmental improvements while also expanding their affluence (that is, growth of capital and consumption).

What likelihood then is there that new or newly applied technology will be able to prevent environmental degradation from expanding along with the economy?

The Jevons Paradox

In order to answer this question it is useful to look at what ecological economists call the Jevons Paradox.¹ William Stanley Jevons (1835-1882) is best known as a British economist who was one of the pioneers of contemporary neoclassical economic analysis, with its subjective value theory rooted in marginal utility. Jevons first achieved national fame, however, for his work *The Coal Question* (1865). Jevons argued that British industrial growth had relied on cheap coal and that the increasing cost of coal, as deeper seams were mined, would generate economic stagnation. Substituting coal for corn, within the general Malthusian argument that says population increases faster than food supply, he observed: "Our subsistence no longer depends upon our produce of corn. The momentous repeal of the Corn Laws throws us from corn upon coal" (*The Coal Question*, 3rd edition, pp. 194-195). Jevons argued that neither technology nor substitutability (that is, the substitution of other energy sources for coal) could alter this.

Jevons was fabulously wrong in his calculations. His main mistake was to underestimate the importance of coal substitutes such as petroleum and hydroelectric power. Commenting on Jevons's argument in 1936, Keynes said it was "over-strained and exaggerated" (*Essays in Biography*, 1951, p. 259).

But there is one aspect of Jevons's argument that has attracted the admiration of ecological economists. Chapter 7 of *The Coal Question* was entitled "Of the Economy of Fuel." Here he argued that increased efficiency in using a natural resource, such as coal, only resulted in increased demand for that resource, not a reduction in demand. This was because such improvement in efficiency led to a rising scale of production. "It is wholly a confusion of ideas," Jevons wrote,

to suppose that the economic use of fuel is equivalent to a diminished consumption. The very contrary is the truth. As a rule, the new modes of economy will lead to an increase of consumption according to a principle recognized in many parallel instances. . . . The same principles apply, with even greater force and distinctiveness to the use of such a general agent as coal. It is the very economy of its use which leads to its extensive consumption. . . . Nor is it difficult to see how this paradox arises. . . . If the quantity of coal used in a blast-furnace, for instance, be diminished in comparison with the yield, the profits of the trade will increase, new capital will be attracted, the price of pig-iron will fall, but the demand for it increase; and eventually the greater number of furnaces will more than make up for the diminished consumption of each. And if such is not always the result within a single branch, it must be remembered that the progress of any branch of manufacture excites a new activity in most other branches

and leads indirectly, if not directly, to increased inroads upon our seams of coal. . . . Civilization, says Baron Liebig, is the economy of power, and our power is coal. It is the very economy of the use of coal that makes our industry what it is; and the more we render it efficient and economical, the more will our industry thrive, and our works of civilization grow. (pp. 140-142)

Jevons went on to argue in detail that the whole history of the steam engine was a history of successive economies in its use—and each time this led to further increases in the scale of production and the demand for coal. “Every such improvement of the engine,” he observed, “when effected, does but accelerate anew the consumption of coal. Every branch of manufacture receives a fresh impulse—hand labor is still further replaced by mechanical labor” (pp. 152-153).

The contemporary significance of the Jevons paradox is seen with respect to the automobile in the United States. The introduction of more energy-efficient automobiles in this country in the 1970s did not curtail the demand for fuel because driving increased and the number of cars on the road soon doubled. Similarly, technological improvements in refrigeration simply led to more and larger refrigerators. The same tendencies are in effect within industry, independent of individual consumption.

Technology and Accumulation

Although Jevons is deservedly credited for introducing his paradox, the full force of the problem he raises is not addressed in *The Coal Question*. As one of the early neoclassical economists, Jevons had abandoned the focus on class and accumulation that characterized the work of the classical economists. His economic analysis was primarily static equilibrium theory, ill-equipped to deal with dynamic issues of accumulation and growth. Jevons, who in many ways naturalized capitalism, could provide no more convincing explanations for continuously increasing demand than to point to individual behavior and Malthusian demographics.

Here it is important to acknowledge that capitalism is a system that pursues accumulation and growth for its own sake. It is a juggernaut driven by the single-minded need on the part of business for ever greater accumulation of capital. “Accumulate, accurnulate! That is Moses and the Prophets!” wrote Marx in *Capital* (vol. I, chapter 24, section 3). The only real checks on this process are those generated by mutual competition and impersonal market forces, and, over the long run, periodic crises.

To be sure, mainstream economists since the days of Adam Smith have claimed that capitalism is a system devoted directly to the pursuit of wealth but indirectly to the pursuit of human needs. In reality, the first goal entirely overrides and transforms the second. Capitalists do not restrict their activities to the production of commodities that satisfy basic human needs, such as food, clothing, shelter, and the amenities essential to the reproduction of human beings and society. Instead, the production of more and more profits becomes an end in itself, and the types of goods produced or their ultimate usefulness becomes completely immaterial. The use value of commodities is more and more subordinated to their exchange value. Use values that are devoted to ostentatious consumption, and that are even destructive to human beings and the earth (in the sense of rendering it unusable for human purposes), are manufactured and the desire for these destructive goods is manufactured along with them through the force of modern marketing (see Paul M. Sweezy, "Capitalism and the Environment," *Monthly Review*, 41: 2, June 1989).²

It is this single-minded obsession with capital accumulation that distinguishes capitalism from all other social systems, explaining why it can never stand still. Competition, of the sort that forces upon capital continual transformations in the means of production in order to maintain and enhance profitability, provides the essential motor behind this drive to accumulate. This is what Joseph Schumpeter, in *Capitalism, Socialism and Democracy*, called capitalism's tendency toward "creative destruction;" its creation through innovation of new and more efficient forms of production and distribution, and at the same time its destruction of previous forms of production and distribution. Caught up in this unrelenting process of accumulation and creative destruction, the system runs roughshod over each and every thing that stands in its path: all human and natural requirements that interfere with the accumulation of capital are considered barriers to be overcome.

The exponential growth of capitalism and the increasing consumption of raw materials and energy that goes with it have resulted in a rapidly compounding environmental problem. It is this that lies behind what the Worldwatch Institute, in its *State of the World* 1999, called "the acceleration of history"—by which was meant the increasingly rapid transformation of the planetary environment and destruction of ecosystems.

Since there is no way in which the earth's fundamental capacity to supply the rapidly increasing demands that are being placed on it can

increase, the only way in which the problem can be solved is by somehow reducing these demands. There are three ways of conceiving this: stabilization and even reduction of world population; improvements in technology; and more far-reaching socioeconomic transformations. Since most demographers agree that population is gradually stabilizing but that this will not in itself solve the problem, given that per capita consumption of materials and energies continues to rise exponentially, the search for a solution invariably focuses on the other two aspects of the problem, and usually on the technological component.

Enter the Kyoto Protocol

The Kyoto Protocol, which requires industrialized countries to cut their emissions of greenhouse gases such as carbon dioxide by an average of 5.2 percent below 1990 levels sometime between 2008 and 2012, has generated enormous resistance among those countries—despite the fact that failure to check the addition of greenhouse gases to the atmosphere would trigger a series of chain reactions, leading to global environmental disaster within a relatively short span of historical time. The United States has not ratified the protocol, and indeed the chances of ratification were so nonexistent that President Clinton did not even send it to the Senate for ratification. Intense negotiations about the level to which carbon dioxide emissions have to be reduced, the allowances to be made for forests (so-called carbon sinks), and the role of tradable pollution permits that would allow states to comply by buying permits to pollute are still taking place.

The main object of the Kyoto Protocol, with regard to carbon dioxide and other greenhouse gases, is to stop the exponential rate of their increase within the atmosphere. A return to 5 percent below the 1990 level of greenhouse gas emissions by 2012 would result in a strong check on the tendency for such emissions to increase exponentially along with the scale of production. At that point, the aim would obviously be to try to maintain this level (assuming no attempt is made to reduce it further), so that emissions increased only arithmetically, not exponentially. Although it should be acknowledged that emissions at 5 percent below 1990 levels would still mean very substantial increases in the total amount of greenhouse gases in the atmosphere.

This is often treated, as I have noted, as a technological problem, particularly where carbon dioxide emissions are concerned. Future efficiencies in energy consumption, in gas mileage, are expected to allow an increase in

the scale of production without worsening the annual additions of carbon dioxide. In the decade following the Organization of Petroleum Exporting Countries (OPEC) oil crisis of 1973, the advanced capitalist countries as a whole, faced with higher oil prices, lowered their overall energy consumption to Gross Domestic Product (GDP) ratio (or energy intensity of GDP) by producing smaller cars with better gas mileage, as well as through other economies in the use of fuel. (Although the Jevons paradox insured that the overall impact of greenhouse gases continued to rise.) Once this decade was over, cheaper oil prices allowed this ratio to rise once more.

The Social Structure of Production and Consumption

Still, it would be wrong to see this as a mere technological problem or one of fuel efficiency, since the technologies that would allow us to avoid such a rapid buildup of carbon dioxide in the atmosphere have long existed. If we take transport, for example, there have long been modern means of transportation, particularly public transit, that would vastly reduce carbon dioxide emissions compared to a transport system built around the private automobile, and that would actually be more efficient in terms of the free and rapid movement of people as well. Instead, the drive to accumulate capital pushed the advanced capitalist countries down the road of maximum dependence on the automobile, as the most efficient way of generating profits. The growth of the “automobile-industrialization complex,” which includes not simply automobiles themselves but the glass, rubber, and steel industries, the petroleum industry, the users of highways for profit (such as trucking firms), the makers of highways, and the real estate interests tied to the urban-suburban structure—constituted the axis around which accumulation in the twentieth century largely turned (Sweezy, “Cars and Cities,” *Monthly Review*, 23: 11, April 1972).

In Paul Baran and Paul Sweezy’s *Monopoly Capital*, which was heavily influenced by Schumpeter’s business cycle theory (in addition to the theories of Marx, Veblen, Keynes, and Kalecki), the authors argued that as a historical system, capitalism has always been dependent on epoch-making innovations. These are the kinds of innovations that alter the entire structure of production and the geography of production on a massive scale and around which the bulk of investment comes to cluster.

For Baran and Sweezy, three epoch-making innovations had come into play in the history of capitalism—the steam engine, the railroad, and the

automobile. What distinguished the automobile in this respect is that it served as an epoch-making innovation twice—in two stages of automobilization. The first was the expansion of automobile production in the period up through the 1920s, including the beginning of the building of highways. The second was the massive buildup symbolized by the construction of the interstate highway system, the destruction of rival forms of public transit, and the accelerated rate of suburbanization that occurred immediately after the Second World War. It is not too much to say that the dominance of the automobile was associated with an entire regime of production and consumption, which has underpinned and still underpins accumulation in the advanced capitalist states.³

It is this automobile-industrial complex that is at the heart of our dependence on petroleum today and that accounts for the largest portion of carbon dioxide emissions. At the time of the Gulf War with Iraq, President Bush told the population of the United States that the purpose of the war was to defend “our way of life.” Everyone knew what this meant: petroleum. Jevons had called coal the “general agent” on which the entire British industrial system depended and the economical use of (or cheapness) of coal as what allowed industry to thrive. Today petroleum plays an equally dominant role in our industrial system.

The capitalist class is divided when it comes to reductions in carbon dioxide emissions to slow down the rate of global warming. A significant part of the ruling class in the United States is willing to contemplate more efficient technology, not so much through a greatly expanded system of public transport, but rather through cars with greater gas mileage or perhaps even a shift to cars using more benign forms of energy. Efficiency in the use of energy, as long as it does not change the basic structure of production, is generally acceptable to capital as something that would ultimately spur production and increase the scale of accumulation (leading to the Jevons Paradox). But a very large and powerful segment of capital in the United States is not willing to accept even this, because greater gas mileage points generally to smaller engines and smaller cars. Auto producers today, more than ever, are making the bulk of their profits from the production of large vehicles, with the growth in the market for sports utility vehicles and minivans. Henry Ford II's well-known adage that “minicars make mini profits,” is still the governing principle. As for the petroleum interests, their vested interest in promoting the demand for oil is obvious. Viewed from this standpoint, it is scarcely surprising

that there were virtually no votes to ratify the Kyoto Protocol within the U.S. Senate.

At every point, meanwhile, capitalists and their acolytes have blocked the implementation of solar power alternatives, some of which are entirely feasible at this stage. Corporations have sought to take over solar power from the grassroots movement, not in order to promote it, but in order to hold it in abeyance. Under capitalism, it is those energy sources that generate the most profits for capital—of which solar power is certainly not one—that are promoted, not those most beneficial to humanity and the earth. (This story has been told by Daniel M. Berman and John T. O'Connor in *Who Owns the Sun?*)

None of this, of course, should surprise us. Thorstein Veblen, who might, along with Rudolf Hilferding, be considered one of the originators of the theory of monopoly capitalism, emphasized the fact that capitalism, although it promoted a certain narrow kind of bottom-line efficiency, nonetheless represented a system of prodigious waste from any rational-planning perspective such as that of the engineer. He characterized the oil industry as one of “clamorous waste and mishandling” that led inevitably to “big business and monopoly control” (*Absentee Ownership*, pp. 200-201). For Veblen, the whole industrial system under monopoly capitalism (or, as he called it, the system of “absentee ownership”) was permeated by reckless and useless consumption of human and natural resources, associated with the dominance of pecuniary goals over rational production. “The distinction between workmanship and salesmanship,” he observed, “has progressively been blurred . . . until it will doubtless hold true now that the shop-cost of many articles produced for the market is mainly chargeable to the production of saleable appearances” (*ibid.*, p. 300).

The sales effort has so penetrated into production itself that the use value criteria for commodities has been undermined and transformed by the needs of exchange value in quite radical ways. From this it is a small step to the Galbraithian “dependence effect”—that what we consume is dependent on the nature of production, rather than the reverse, as assumed in the “consumer sovereignty” hypothesis of neoclassical economics (Galbraith, *The Affluent Society*, chapter 11). Control over production, coupled with the force of modern marketing, has given capital the power to manufacture “needs” (i.e., desires) along with products. In fact, “product development” in the giant corporation is usually seen as a subdivision of marketing.

Journalists never tire of pointing to the love of the automobile in the United States. But such “love” is more often than not a kind of desperation in the face of extremely narrow options. The ways in which cars, roads, public transports systems (often notable by their absence), urban centers, suburbs, and malls have been constructed mean that people often have virtually no choice but to drive if they are to work and live. Under these circumstances the car (or minivan), which consumers seem to crave, also becomes a kind of prison, made more tolerable (if only barely) by the introduction of cell phones and other gadgets. Meanwhile the social costs pile up. “Capitalism,” as K. William Kapp declared in *The Social Costs of Private Enterprise*,

must be regarded as an economy of unpaid costs, “unpaid” in so far as a substantial portion of the actual costs of production remain unaccounted for in entrepreneurial outlays; instead they are shifted to, and ultimately borne by, third persons or by the community as a whole. (p. 231)

In such a system, it makes no sense to see possibilities for sustainable development as limited to whether or not we can develop more technological efficiency within the current framework of production—as though our entire system of production, with all of its irrationality, waste, and exploitation, has been “grandfathered” in. Rather, our hopes have to be pinned on transforming the system itself. This means not simply altering a particular “mode of regulation” of the system, as Marxist regulation theorists say, but in transcending the existing regime of accumulation in its essential aspects. It is not technology that constitutes the problem but the socioeconomic system itself. The social-productive means for implementing a more sustainable relation to the environment within the context of a developed socioeconomic formation are available. It is the social relations of production that stand in the way.

The Irreversibility of Capitalism's Environmental Crisis

Any attempt to follow out this contradiction in detail would take me well beyond the confines of the present essay. I agree with Paul Sweezy, who said in “Cars and Cities,”

while I believe certain palliatives to be possible, at least in principle, within the framework of the present monopoly capitalist system, I do not think that fundamental changes in the structure of cities and their relation to society as a whole [or equally large changes within the structure of production and consumption] can be effected without a radical change in the social order.⁴

For Marx, the very nature of capitalist society from the very beginning had been built on a metabolic rift between city and country, human beings and the earth—a rift that has now been heightened beyond anything that he could have imagined (see Foster, “Marx’s Theory of Metabolic Rift,” *American Journal of Sociology*, September 1999). There is an irreversible environmental crisis within global capitalist society. But setting aside capitalism, a sustainable relation to the earth is not beyond reach. To get there, we have to change our social relations.

Jevons had no answer to the paradox he raised. Britain could either rapidly use up its cheap source of fuel—the coal upon which its industrialization rested—or use it up more slowly. In the end, Jevons said they should use it up rapidly: “If we lavishly and boldly push forward in the creation of our riches, both material and intellectual, it is hard to over-estimate the pitch of beneficial influence to which we may attain in the present. But the maintenance of such a position is physically impossible. We have to make the momentous choice between brief but true greatness and longer continued mediocrity” (*The Coal Question*, pp. 459-460). Put that way, the direction to be taken was clear: to pursue glory in the present and a drastically degraded position for future generations. Insofar as Jevons’s paradox continues to apply to us today—that is, insofar as technology by itself (given the present framework of production) offers no way out of our environmental dilemmas, which generally increase with the scale of the economy—we must either adopt Jevons’s conclusion or pursue an alternative that Jevons never discussed and which doubtless never entered his mind: the transformation of the social relations of production in the direction of socialism, a society governed not by the search for profit but by people’s genuine needs, and the requirements of socio-ecological sustainability.⁵

- 1 See Mario Giampietro and Kozo Mayumi, “Another View of Development, Ecological Degradation, and North–South Trade,” *Review of Social Economy*, 56: 1 (Spring 1998), pp. 24–6.
- 2 The literature on the importance of the Marxian distinction between use value and exchange value in understanding environmental problems (including the relation between economic waste and social-environmental costs) is vast. See, for example, John Bellamy Foster and Henryk Szlajfer, *The Faltering Economy* (New York: Monthly Review Press, 1984), pp. 297–316; Shigeto Tsuru, *The Political Economy of the Environment* (London: Athlone Press, 1999); and Paul Burkett, *Marx and Nature* (New York: St. Martin’s Press, 1999).
- 3 Regulation theorists speak of a “regime of accumulation,” geared to automobilization, which they call “Fordism.” But this is historically misleading for various rea-

sons. See John Bellamy Foster, "The Fetish of Fordism," *Monthly Review*, 39: 10 (March 1988), pp. 14–33.

- 4 Paul Sweezy. "Cars and Cities." *Monthly Review*, 51: 11 (April 2000), p. 32. (first published in *Monthly Review* in 1972).
- 5 "An energy revolution is both possible and necessary, but it will be achieved only as part of a broader revolution that takes power away from capital and puts it in the hands of the people where it belongs." Paul M. Sweezy, "The Guilt of Capitalism," *Monthly Review*, 49: 2 (June 1997), p. 61.

A slightly different version, under the same title, was published in Japan in the Hitotsubashi Symposium, "The Twentieth Century: Dreams and Realities," Hitotsubashi University, Tokyo, December 2-3, 2000.

10—The Limits of Environmentalism without Class

LESSONS FROM THE ANCIENT FOREST STRUGGLE IN THE PACIFIC NORTHWEST

Many prominent environmentalists today have adopted a political stance that sets them and the movement that they profess to represent above and beyond the class struggle. For example, Jonathon Porritt, the British Green leader, has declared that the rise of the German Greens marks the demise of “the redundant polemic of class warfare and the mythical immutability of a left/right divide.”¹ According to this outlook, both the working class and capitalist class are to blame for the global environmental crisis (insofar as it can be traced to capitalist rather than socialist modes of production), while the Greens represent a “new paradigm” derived from nature’s own values, one that transcends the historic class problem. By removing themselves in this way from the classic social debate, these Green thinkers implicitly embrace the dominant “we have seen the enemy, and it is us” view that traces most environmental problems to the buying habits of consumers, the number of babies born, and the characteristics of industrialization, as if there were no class or other divisions in society.

In contrast, it will be argued here—in the context of a discussion of the crisis of the old-growth forest and the timber industry in the U.S. Pacific Northwest—that rapid ecological degradation is an inherent part of the historically specific accumulation process that defines capitalist society and its class struggle.² An ecological movement that stands for the earth alone and ignores class and other social inequalities will succeed at best in displacing environmental problems, meanwhile reinforcing the dominant relations of power in global capitalism, with their bias toward the unlimited commodification of human productive energy, land, and the built environment,

and the ecology of the planet itself. An earth movement of this kind will therefore contribute little to the overall green goal of forming a sustainable relationship between human beings and nature, and may even have the adverse effect—by splitting popular forces—of creating more opposition to the environmental cause.³

Nowhere is this overall dilemma of class versus ecology more evident today than in the Pacific Northwest, where the battle to save the last stands of ancient forest has left forest product workers and single-issue environmentalists at each other's throats. In timber-dependent communities, "preservationists" have been accused of being "enemies of the people," while single-issue environmentalists for their part have often characterized loggers and other forest product workers as "enemies of nature." "The northern spotted owl," Michael Renner observed in Worldwatch's *State of the World* 1992, "has become a symbol of the seemingly intractable conflict between jobs and environmental protection—and of the larger tensions between the health of the economy and that of the natural world on which it ultimately depends."⁴

The truth is that both a sustainable relation to the forest ecosystem and employment stability for workers in the industry are best achieved through the forging of an alliance between environmental activists and forest product workers around a common labor-environmentalist program aimed at the state. Yet the narrow conservationist thrust of most environmentalism in the United States, the unimaginative business union response of organized labor, and the divide-and-conquer strategy employed by timber capital and its allies within the federal government against its two most powerful opponents—the working class and the environmentalists—have thus far combined to block the formation of any such coalition.

By 1992 environmentalists seemed to have won a resounding victory in their long struggle to protect the ancient forest of the Pacific Northwest. Attempts by the Bush administration to promote logging in areas that threatened the existence of the northern spotted owl had been overturned by the courts, while the election of the Clinton administration seemed to many to hold out the hope that the federal government would place much greater emphasis on environmental concerns. Six years later, however, the sense of victory on the side of environmentalists was replaced by a growing sense of betrayal—if not yet outright defeat. The passage of the salvage logging rider of the Budget Rescissions Act, signed into law by President Clinton in July 1995, set aside the nation's environmental laws, opening up the

ancient forest to rapacious logging once again, and threatening the existence of the marbled murrelet, the northern spotted owl, and numerous other species of the region. The Endangered Species Act itself is now under continual attack within Congress. Most threatening of all, the 1990s have seen the growth of a corporate-financed Wise Use coalition able to mobilize many thousands of workers, along with officers of resource-extracting corporations, landowners, cattle grazers, and realtors—providing a new political base and “populist” rationale for business-serving politicians seeking to undermine existing environmental laws.

Hence, more than ever before it is crucial to discover the means of forging a wider labor-environmentalist alliance, and to learn the lessons that the struggle for the ancient forest of the Pacific Northwest has to teach to environmentalists generally. To understand how a united front between forest product workers and forest ecosystem defenders might have been (and still could be) established in the Northwest it is necessary to explore this ecological crisis in its making, with particular attention to the role of capital and the state. Such an account would reveal the class origins of the ecological crisis, together with the general outlines of a progressive class-based response to the stranglehold that the jobs versus nature issue now maintains over the entire environmental movement.

Ecological Catastrophe and Social Crisis

At the time of the Lewis and Clark expedition the ancient conifer forest, dominated by trees hundreds of feet in height and centuries—sometimes more than a millennium—old, covered some 20 million acres in western Oregon and western Washington alone. Today only around 12 percent or 2.4 million acres of fully intact “old-growth forest” remains—consisting of centuries-old trees, a multilayered canopy, numerous large dead standing trees, or “snags,” and large downed trees on the ground and across streams—according to the most advanced old-growth inventory available from Peter Morrison of the Wilderness Society. Since private capital has cleared its land of nearly all of the original forest, the ancient forest that is left is to be found almost exclusively on public lands. Moreover, these last stands of late successional forest are largely confined to the higher elevations (above 2,500 feet) and are to be found in a crazy quilt of isolated patches—the result of patterns of land acquisition, logging, road building, and land clearances. According to data released in June 1992 by NASA scientist Dr. Compton J. Tucker, who

has led a project comparing satellite photos of the Pacific Northwest and Amazon forests, the Northwest forest has been subject to “severe fragmentation” and “has been literally cut to pieces.” “When you compare the situation in the Pacific Northwest to the Amazon of Brazil [in this respect], the Northwest is much worse.” Biologists have drawn an analogy between the Northwest forests and a shirt perforated again and again, to the point that there are now more holes than cloth. In 1990 about 800,000 acres of the remaining intact old-growth forest, according to the Morrison estimates, were protected in parks and wilderness areas. The other 1.6 million acres—more than half of which are already highly fragmented—were open to exploitation. In the 1980s, these stands of old-growth forest were disappearing at a rate of perhaps as much as 70,000 acres a year. If this rate of cutting had continued, the unprotected regions of the old-growth forest in Oregon and Washington would have been gone in less than 30 years.⁵

It was under these general conditions that two opposing forces converged in the 1980s to form a highly volatile situation with respect to the management of the old-growth forest. The first of these was evident in the implementation of a process of economic restructuring, arising out of the economic stagnation of the early 1980s, that required the ever more rapid liquidation of the old-growth forest, together with increased exploitation of forest products workers. Responding to a decline in the secular growth trend of the economy, capital in the Reagan period attempted to restructure the economy and state in ways that would remove any regulatory limits that had been placed on free-market exploitation of the natural and human “conditions of production.”⁶ As we will see, in the case of the Northwest national forests, this meant a subversion of the long-established principle of sustained yield, insofar as this could be interpreted as a “nondeclining *even flow*” of timber, and its replacement by a policy of increased cutting and rapid old-growth liquidation designed to maximize government revenues, bridge the gap in private timber supplies, and clear the ground for a “fully managed” system of plantation forestry in the national forests.

The second converging force took the form of a rapidly growing environmental movement determined to defend the ecological integrity of the Northwest forests. In the face of a stepped-up campaign of forest restructuring aimed at the liquidation of the remaining old growth, environmentalists in the 1980s struck back with every means at their disposal: blockading logging roads with their bodies, tree sitting, and filing a flood of legal proceedings designed to slow down and eventually halt the removal of ancient

timber. A crucial turning point in the struggle came in 1988 when a federal court in Seattle upheld an environmentalist lawsuit claiming that the federal government had violated the requirements of the Endangered Species Act in failing to take steps to preserve the habitat of the northern spotted owl, a rodent-eating predator high up on the old-growth forest's food chain.

Environmentalists were aided not only by strong environmental law—the Endangered Species Act—but also by a series of scientific advances in the ecological understanding of the old-growth forest that strongly reinforced the case for preservation. With the release of the landmark 1981 study *Ecological Characteristics of the Old-Growth Douglas-Fir Forests*, authored by Forest Service ecologist Jerry Franklin and his associates, together with other related studies, it was demonstrated that the late successional or old-growth forest was by far the richest and most ecologically complex stage in the forest's existence, supporting a yet uncataloged diversity of life forms, many of which are now endangered as a result of forest fragmentation and destruction of critical habitat. Individual stands within the old-growth forest were discovered to be “unrivaled both in the size and longevity of individual trees and in the accumulation of biomass of individual stands.” Among the coastal redwoods the old-growth coniferous forest was found to exceed that of any tropical rainforest thus far measured in total accumulated biomass per unit area by a ratio of seven to one, while forests throughout the old-growth coniferous region were found to support biomasses far beyond those of tropical forests (though the latter are unrivaled in the diversity of life that they support). Moreover, it was revealed that the old-growth forest stored more carbon per unit area than any other terrestrial ecosystem thus far measured, making it a significant factor in the stabilization of the world's climate in the face of global warming. These and other new discoveries thus represented a scientific advance in forest ecology that seemed to point inexorably to the imperative of preservation.⁷ Environmentalists became adept at disseminating this new ecological understanding—much of it the product of the work of government scientists, some of whom were drawn into the controversy as it unfolded—to an ever larger public through an impressive outpouring of critical articles, books, and videos. Biologists thus obtained the enmity of those determined to maintain high levels of cutting in the Northwest national forests. Yet, charged by the Endangered Species Act with evaluating the chances for preservation of the critical habitat necessary to maintain a threatened species, government scientists in study after study continued to confirm

the dire threat to the northern spotted owl, and indeed to the entire Northwest forest, reinforcing the environmentalist argument.

The convergence of these opposing economic and ecological forces in the early 1980s therefore signaled the emergence of contradictory conditions of the kind that Carolyn Merchant has associated with “ecological revolutions.” These are characterized by “widening tensions between the requirements of ecology and production in a given habitat and between production and reproduction.”⁸ As it became clear that the very existence of the ancient forest ecosystem was in danger, environmentalists, scientists caught up in the dispute, the judicial arm of the state (under the pressure of the Endangered Species Act and other environmental laws), and certain sections of the Forest Service, Bureau of Land Management, and Fish and Wildlife Service bureaucracies came to side with “the requirements of ecological reproduction,” while the forces of capital and the command posts of the state (mainly within the topmost echelons of the federal executive) leaned toward the interests of production. The result was a widening ecological and class war as capital stepped up its efforts to exploit the old-growth forest, environmentalists responded on behalf of the forest, and the workers, caught in the middle, struggled to defend their economic livelihoods.

In April 1990, a scientific study carried out in conformity with the Endangered Species Act by an interagency panel of government biologists (known as the Jack Ward Thomas report, after the panel’s chairperson) proposed setting aside more than 5 million acres of federal timberland in the form of “habitat conservation areas” to protect the northern spotted owl. If implemented this would have effectively doubled the amount of protected lands in the public forests of Washington, Oregon, and northern California, leading to an almost 50 percent drop in annual federal timber sales from the region. But even if this habitat conservation plan were fully adhered to, according to the biologists who prepared the report, the northern spotted owl’s population could be expected to plummet by as much as one-half, from its estimated level of about 3,000 pairs, over the next several decades.

It is important to emphasize that, since the remaining old-growth acreage is not only limited but exists only in the form of scattered patches, the preservation of the owl habitat depends almost as much on the preservation of numerous “corridors” linking areas of widely dispersed old-growth forest (often occurring in a checkerboard pattern) as on the protection of the intact old-growth forest itself. Moreover, environmentalists have naturally struggled to preserve those acres of forest land that,

while not conforming to the strictest definition of old growth—usually because the ecology had been damaged in some way—nevertheless embody a wealth of biological values, including the capacity to help support owl and other endangered species populations. Finally, in practice the issue has often boiled down to where to draw the lines on the map, raising practical, jurisdictional issues related to the extent and usage of various sections of the national forests. The battle to preserve the ancient forest in Washington, Oregon, and California therefore involved from the very start several times the area represented by the 2.4 million acres in Washington and Oregon that, according to the Morrison estimates, could be classified as fully intact old-growth forest. Environmentalists, in fact, tended to view the Jack Ward Thomas plan—despite its commitment to setting aside more than 5 million acres—as inadequate for the preservation of the old-growth forest ecosystem, since this plan had envisioned a further drastic decline in northern spotted owl populations over the ensuing decades.

The Jack Ward Thomas plan, the Forest Service estimated, would lead to the loss of 28,000 timber jobs over the next decade. At the same time, grossly inflated industry estimates placed the number of jobs to be lost due to the direct and indirect effects of the Thomas plan at more than 100,000. Soon the northern spotted owl was on the cover of *Time* magazine—under the sardonic heading “Who Gives a Hoot?”

Under pressure from the law, the environmentalists and the courts, the U.S. Fish and Wildlife Service, acting on the results of the Thomas report, officially listed the northern spotted owl as a threatened species under the Endangered Species Act in June 1990. From that point on, the crisis only seemed to intensify. In April 1991, the U.S. Fish and Wildlife Service announced that it would evaluate up to 11.6 million acres in Washington, Oregon, and northern California for possible protection to preserve the habitat of the northern spotted owl. Over the course of the following year, while court injunctions effectively banned most logging in the old-growth forests pending the adoption of plans in conformity with the Endangered Species Act, the number of acres under consideration for protection dropped from 11.6 to 8 to 7 million acres; and when the Fish and Wildlife Service unveiled its final recovery plan for the owl in May 1992, the amount of critical habitat to be protected had been reduced to 5.4 million acres—approximately equal to the Jack Ward Thomas plan—with projected job losses at 32,000. In contrast to the Thomas plan, however, the recovery plan estimated the loss of less than one-quarter of the total owl population,

with the expectation that the remaining habitat would support 2,300 pairs of owls in comparison to the present 3,000. Moreover, the multidisciplinary, scientific team responsible for the recovery plan presented a fairly optimistic scenario suggesting that the owl population would be sufficiently large and well dispersed for the owl to survive, replenish its numbers, and, at some point, be removed from the threatened species list.

Still, in the view of the Bush administration, the recovery plan provided by the Fish and Wildlife Service in conformity with the requirements of the Endangered Species Act—although a necessary step in getting the courts to allow a resumption of logging in the Northwest national forests—was not acceptable. The idea was to undermine it from the outset, as part of a larger campaign against the Endangered Species Act itself. Secretary of the Interior Lujan had publicly voiced the opinion that “maybe we should change the [Endangered Species] law. . . . The spotted owl business is probably the prime example.” The first major thrust in the Bush administration counter-attack, dubbed an “Act of God” by the Southern Forest Products Association, was to convene in 1992 (for only the third time in its history) the Endangered Species Committee, commonly known as the “God Squad” because of its power to override species preservation on the grounds of economic necessity. The second major thrust was to release a separate Interior Department plan at the same time as the Fish and Wildlife Service recovery plan—with the express purpose of undermining the latter.⁹

The God Squad’s membership, as set out in the Endangered Species Act, includes the secretaries of the interior, agriculture, and army, the heads of the President’s Council of Economic Advisers, the Environmental Protection Agency, and National Oceanic and Atmospheric Administration (all of whom are presidential appointees), and a representative from each affected state (in this case Oregon). On this occasion, the God Squad had been convened at a Bureau of Land Management (BLM) request to decide on whether to override the Endangered Species Act in the case of 44 sales of BLM timber. As reported in the *Portland Oregonian* (May 17, 1992), “The God Squad met . . . in the Interior Secretary’s small, wood-paneled ceremonial conference room. Access was tightly restricted, but Lujan’s staff reserved 10 seats for ‘constituents.’ All 10 were filled by representatives of the timber industry, labor unions and timber communities.”

The result was as expected. In a largely symbolic attack, the main effect of which was to throw doubt on the Endangered Species Act, the God Squad voted 5-2 (the head of the EPA, William Reilly, and the Oregon

representative dissenting) in May 1992 to exempt 13 BLM timber sales from the requirements of the act.

Immediately following the God Squad vote, Lujan released both the recovery plan mandated by the Endangered Species Act and the rival Interior Department plan promoted by Lujan himself. In the Lujan plan, prepared by a small team of Interior Department officials that included no biologists, the area to be protected would be slashed by nearly one-half (to only 2.8 million acres), reducing the number of habitat conservation areas from 196 to 75, while the surviving owl population, as estimated by the plan, would decrease to a maximum of 1,300 breeding pairs out of the 3,000 pairs now existing. According to Lujan, this Interior Department plan would result in the loss of only 15,000 jobs. However, since the Lujan plan would fail to protect the threatened species throughout its range, it represented a clear break with the provisions of the Endangered Species Act and would require special congressional legislation to be put into effect. Environmentalists immediately labeled the Lujan proposal an "extinction plan." Those who saw the Interior Department plan in these terms included scientists responsible for the preparation of the Thomas and recovery plans. In the cautious estimation of Jonathan Bart, who headed the government's multidisciplinary recovery plan team, the Lujan plan by providing insufficient habitat would "eventually result in extinction" over many decades of the northern spotted owl.

Confident that the wind was changing in their direction, supporters of the timber industry greeted the Lujan plan with only a lukewarm response. Although some timber industry representatives declared that the Interior Department plan was a "step in the right direction," other defenders of the Northwest industry, such as Republican Senator Bob Packwood from Oregon, refused to support even the Lujan plan on the grounds that it would eliminate too many jobs, claiming, "It comes down to this: are you for people or for the bird?" Still others declared that even the 75 conservation areas to be set up in the Lujan plan were unnecessary, on the spurious grounds that the owl could survive in second-growth forest.¹⁰

For many, however, the virulence of the Bush administration's assault on environmental legislation, the northern spotted owl, and the old-growth forest no doubt came as a considerable surprise. Indeed, what has made the nature of the ancient-forest crisis so mysterious from the beginning has been the tendency for most establishment discussions to focus in fetishized fashion on timber, owls, loggers, and environmentalists while

ignoring the major historical agent of change: capital itself including the capital-state partnership (“a *partnership* between two different separate forces, linked to each other by many threads, yet each having its own separate sphere of concern”).¹¹

The existence of a capital-state partnership of this kind explains the continuity between the Bush and Clinton administrations in their management of the Pacific Northwest forests. After presiding over a Forest Summit in Portland, Oregon, and considering eight options to deal with the crisis of the ancient forest and the threat to the existence of such endangered species as the spotted owl and the Northwest salmon, Clinton insisted on the development of an “Option Nine.” Ostensibly a proposal for protecting the old-growth forest—one that would reduce historic logging levels—Option Nine was nonetheless so full of holes that it left more than 40 percent of the remaining old growth completely unprotected, with much of the rest also opened up to aggressive thinning and salvage logging operations. As many as 200 different species of plants and animals remain in danger of extinction. Meanwhile, the administration refused to move against log exports—the one measure that would have done the most to expand employment opportunities in the industry. In addressing the ecological crisis, the Clinton administration thus stayed well within the bounds dictated by the corporations. Indeed, by June 1995 Clinton was to declare that “I’ve done more for logging than any single person in the country.” A month later he signed the Budget Rescissions Act, which included the notorious salvage logging rider, setting aside the nation’s environmental laws under the cover of a “forest health crisis,” and thus opening up vast tracts of the national forest to logging, further endangering such species as the marbled murrelet, the northern spotted owl, and the Northwest salmon.¹²

From the beginning of this struggle, the giant forest products firms deliberately stayed behind the scenes, leaving the defense of their interests to their major political lobbying organizations, the American Forest Resource Alliance and the National Forest Products Association. Meanwhile, few mainstream commentators have thought it worth their while to explore the historical dimensions of this ecological catastrophe brought on by the accumulation of timber capital. The public is thus left with the distinct impression that the whole problem can be reduced to an irreconcilable conflict between workers and environmentalists, between owls and jobs—a conflict in which the state is presumably neutral and capital is notable mainly by its absence. It is this great silence with respect to timber

capital's historic role, including its partnership with what might be termed the "natural resource state," that must be penetrated if a realistic understanding of the fate of the forest is to emerge.¹³

Monopoly Capital and Environmental Degradation: The Case of the Forest

Most forest land in the United States is privately owned. The largest part belongs to farmers, ranchers, and small owners, while a handful of giant timber corporations, owning only a small portion of the whole, but in control of vast tree plantations in the most productive tree-growing regions in the Southeast and the Northwest, dominate timber production nationwide. These "even-aged industrial plantations" with their monocultures of pine and fir have been dubbed "forestry's equivalent to the urban tower block."¹⁴

Such concentrated control of the conditions governing the production and marketing of timber by a relatively small number of firms at the apex of the industry, Veblen argued early in the twentieth century, emerged in accordance with "the characteristic traits of the American plan [of natural resource exploitation]—initial waste and eventual absentee ownership on a large scale and quasi-monopolistic footing." In the Northwest, the giant private forest holdings were formed during the monopolistic drive at the turn of the century, with the largest tracts emerging from railroad property. In 1900, the Weyerhaeuser Timber Company came into being when the Northern Pacific Railroad sold 900,000 acres of virgin timberland to a group of Midwestern logging entrepreneurs headed by Frederick Weyerhaeuser. Today six companies, led by Weyerhaeuser, own more than 7 million acres of forest in the Northwest. As a result, these firms are able to dominate the entire forest product industry in the region—from the growing and harvesting of trees, to the operation of lumber and plywood mills and pulp and paper factories, to the marketing of the final products. Smaller forest product companies, lacking significant private forest lands of their own, must rely almost entirely on access to public timber to feed their mills.¹⁵

From the beginning, the power of the large timber firms depended on their ability to limit competition and prevent prices from falling by keeping an oversupply of timber from reaching the market. By the late 1920s, however, the Northwest timber industry was experiencing a serious glut of supply, followed by a depression in 1929. Timber capital therefore encouraged the federal government to add tens of billions of additional board feet of

“standing timber” to the national forests (150 billion board feet [bbf] were added in 1933 alone) to be harvested, in contrast to the more rapid rate of cutting on private lands, only on a sustained-yield basis. In this way, the major corporations were able to achieve the following three objectives: (1) limiting the supply of timber on the market; (2) maintaining higher prices for their own timber; and (3) establishing timber community stability (hence the existence of a readily exploitable labor force) in what were essentially company towns.

With the coming of World War II, market conditions changed and total national timber production ratcheted upward, from a low of 17 bbf in 1933 to 36 bbf in 1941. Timber production continued to climb after World War II as a result of pent-up demand for housing and programs such as Veterans Administration mortgages. It was the Korean War boom, however, that produced the peak in private timber harvests in the Northwest. In 1952, corporations removed enough board feet from private lands in Oregon alone to house both Oregon’s two million people and San Francisco’s 700,000. From this point on, private timber harvests declined sharply. Yet corporations continued to cut trees at a frenetic pace and were slow to replant prior to the 1960s. As a result, timber companies and homebuilders began to demand more intensive harvesting of high-value old growth on public timberlands to compensate for the shortages in private supplies. Annual removals of national forest timber rose from 3 bbf in 1945 to 13 bbf in 1970. Yet this was not enough for the corporations. In 1970, a Nixon administration task force, bowing to pressures from industry, wrote that “a goal of about 7 billion board foot annual increase in timber harvest from the national forests by 1978 is believed to be attainable and consistent with other objectives of forest management.”¹⁶ By the 1980s, this “mining” of ancient timber had produced a sharpened contradiction between ecological and economic requirements. On the one hand, an environmental movement grew by leaps and bounds as a result of growing concern over the vanishing forest, reinforced by a more sophisticated scientific understanding of the late successional forest ecosystem. On the other hand, conditions of economic stagnation in the late 1970s and 1980s—reflected in a drop in housing starts from two million in 1976 to one million in 1982—put renewed pressure on capital to restructure its relation to both labor and the environment, speeding up its exploitation of both.

In this developing contradiction, it was the immediate economic imperative that initially had the upper hand. During the Reagan years, increased

sales of national forest timber were seen as a means of lowering lumber prices and overcoming a severe slump in housing. At the same time, the pull of the world market was exerting increased pressure on U.S. timber supplies. More and more timber was finding its way abroad in the form of unprocessed logs destined mainly for Asia, where the selling price for logs was up to 50 percent higher than in the United States. In 1987, 3 bbf of logs were exported from U.S. Pacific ports to Pacific Rim countries—almost 70 percent to Japan alone. By 1988 this amount had reached 4 bbf (equivalent to about 60 percent of the total harvest from federal lands in Oregon and Washington). Meanwhile, U.S. imports of Canadian lumber between 1975 and 1985 rose from less than one-fifth to one-third of U.S. softwood lumber consumption.¹⁷ Although the government prohibits the export of logs from federal forests, the fact that logs from private lands are being shipped in large quantities abroad means that the overall demand for timber is increased and local sawmills are forced to rely more and more on public timber from the old-growth forests for their supplies.

Eager to exploit growing world demand for logs and at the same time force down U.S. lumber prices, the Reagan administration pursued every means at its disposal to accelerate federal timber harvests. The man appointed to accomplish this as assistant secretary of agriculture for natural resources and the environment (hence the boss of the Forest Service), was John Crowell, Jr., formerly general counsel for Louisiana Pacific, the largest purchaser of federal timber. No sooner was his appointment confirmed than Crowell proposed a doubling of the rate of harvest from federal forest lands in Oregon and Washington, from an annual rate of 5 bbf to 10 bbf by the 1990s. Since this rate of cutting was far beyond what could be regarded as sustained yield, it was immediately apparent that Crowell stood for the quickest possible liquidation of the remaining stands of ancient forest. The chief barrier to “more efficient National Forest management,” Crowell asserted, “has been the timber policy of ‘non-declining even flow.’ . . . The volume of wood present in these old-growth forests far exceeds what would be present as growing stock inventory once the forest is in a fully managed condition.”¹⁸ Or, as he stated more succinctly elsewhere, “If you cut the old growth you’re liquidating the existing inventory and getting the forests into a fully managed condition.”¹⁹

The entire Reagan strategy of increased exploitation of the U.S. national forests—it is crucial to understand—depended on a vastly accelerated rate of

cutting in the Northwest in particular, since it was from these national forests that the great bulk of the net proceeds from Federal timber sales were obtained, thought most Federal timber placed on the market came from forests in other parts of the country. In 1987, 90 percent of the net receipts from Forest Service timber sales came from the 12 Northwest forests, which nevertheless accounted for only one-third of the timber harvested from U.S. national forests that year.²⁰ Costs associated with timber sales (road building, etc.) depend on the area sold, but revenues depend on the volume of timber sold as well as wood quality. Both volume/area and quality are very high in the Northwest old-growth forests, which make them by far the most profitable area of U.S. Forest Service operations. Profit criteria therefore demanded higher rates of cutting in these forests. And since almost everywhere else in the United States the Forest Service was, in fact, selling timber at a complete loss, continued sales of high-value old-growth timber in the Northwest were essential to keep the overall timber sales budget in the black and thus to prevent enormous losses elsewhere—and hence the full extent of the federal timber subsidy to capital—from becoming visible.

But in order to carry out its plan of increasing sales and harvest levels in the Northwest national forests, dictated by all of these factors, the Reagan administration found it first necessary to deal with the crisis in the timber industry brought on by the depression in the national homebuilding market, which had been badly hit by the effects of skyrocketing interest rates in the early Reagan era. And this meant lowering the price charged to timber companies for federal timber from the Northwest still further. Contract arrangements for federal timber have traditionally allowed firms to purchase cutting rights for standing timber and to delay harvesting for two to five years until market conditions were favorable—a policy that has encouraged widespread speculation. The housing crash of 1982 thus left timber firms sitting on vast inventories of federal timber that were now overpriced in relation to depressed domestic lumber prices. Through the timber contract bailout of 1984, signed into law by President Reagan, the federal government made it possible for firms to profit from this situation by releasing them from contracts for billions of board feet of uncut timber and then reselling the same trees back again to the companies at bargain-basement, recession-level prices. Profits soared as corporations and Northwest members of Congress forced the sale of high volumes of low-cost federal timber (with both sales and harvests reaching near record levels) throughout the remainder of the 1980s and in the first year of the following decade.²¹

Meanwhile, internal BLM plans in 1983 to trim cutting and introduce longer rotation times in the forests in western Oregon under its jurisdiction, in the face of dwindling agency timber supplies, were suddenly scotched late that same year (some of those involved believe that the BLM's parent agency, the Interior Department, then headed by James Watt, was responsible) and timber harvests were instead increased. Thus, it comes as no surprise that internal BLM memos made public in 1990 warned that the agency had been harvesting at unsustainable levels and was running out of trees to cut. "In some cases there is no place to go after 1991," one internal memo noted.²²

Equally disastrous from the standpoint of sustainability was the granting, beginning in 1984, of federal subsidies for private log exports—under rules pertaining to a wide variety of export commodities—that allowed timber firms with foreign-based sales operations (i.e., multinationals) to obtain tax exemptions of 15-30 percent of their export income. By 1992, this was costing the U.S. Treasury \$100 million a year in lost revenue. According to U.S. Representative Les AuCoin (D-OR), Plum Creek Timber (formerly Burlington Northern) used these subsidies for log exports to export in effect over 5,000 U.S. forest product jobs in the 1980s while pocketing \$33 million in tax savings.²³

Ecological Conflict and the Class Struggle

The first real sign that the traditional, rather peaceful give-and-take over U.S. forest lands between accumulation and conservation had been radically transformed by the 1980s in ways that suggested the emergence of an era of confrontation occurred in April, 1983, when four Earth Firsters appeared out of nowhere in the Siskiyou National Forest in Oregon and took their stand between a running bulldozer and a tree. Before long, radical environmentalists were sitting on company dynamite to prevent blasting, tree spiking (driving large nails into trees in order to hinder the cutting and processing of timber), tree sitting, chaining themselves to timber equipment, and forming human barricades on logging roads by setting their feet in cement-filled ditches or inserting themselves in rock piles.²⁴

While Earth Firsters chose a path of direct confrontation, other environmental groups relied on legal action. Soon federal agencies found themselves immersed in a flood of lawsuits and administrative appeals. In 1987, 25 environmental groups filed the first of three spotted owl lawsuits

through the Sierra Club Legal Defense Fund,²⁴ thus setting in motion the chain of events leading to the release of the Jack Ward Thomas report and the listing of the owl as threatened in the spring and summer of 1990.

For Northwest forest products workers these actions by environmentalists were naturally viewed with growing anguish. There can be no doubt that the impending “locking away” of millions of acres of public timberland increased the economic insecurity of thousands of workers. Soon, frustration with what they saw as an extreme preservationist ethic was inducing many workers to display angry bumper stickers such as “I Love Spotted Owls—Fried”—often seen in timber areas of the Northwest. On a number of occasions, owls (not northern spotted owls, because they are hard to find) have been found killed and nailed to trees or road signs. One was discovered with its head placed in a noose.

Timber firms have generally sought to reinforce this rage of the workers against environmentalists, adding fuel to the fire at every possible opportunity, with sawmill owners actually sponsoring antipreservationist lectures during working hours at the mills. More tragic, however, is the fact that environmentalists have sometimes fed this rage through the insensitivity with which they have occasionally greeted the plight of the workers. For example, the Native Forest Council—well known throughout the Northwest for its radical environmentalist publication *Forest Voice*—has argued that the problem of workers threatened by displacement can be left to the condign sanctions of the market:

A market economy does not maintain an industry simply for the sake of employing workers. When a product becomes obsolete or a resource runs dry, the economy adapts. Companies and industries have been changing or shutting down for 200 years, and workers always find new jobs—the nation is not lacking in jobs; it's a natural, necessary component of capitalism. Chopping down forests for the sake of jobs is nothing more than social welfare—not something our nation prides itself on.²⁵

Such unsympathetic attitudes toward workers are not uncommon among those who see themselves as representatives of “deep ecology.” This can be seen in a position taken by Dave Foreman, cofounder of Earth First! (but now departed from the organization):

One of my biggest complaints about the workers up in the Pacific Northwest is that most of them aren't “class conscious.” That's a big problem. . . . The loggers are victims of an unjust economic system, yes, but that should not absolve them for everything they do. . . . Indeed, sometimes it is the hardy swain, the sturdy yeoman from the bumpkin proletariat so celebrated in Wobbly lore who holds the most violent and destructive attitudes towards the natural world (and towards those who would defend it).²⁶

Despite the radical rhetoric, there can be no doubt that Foreman exhibits an extremely condescending attitude here toward workers (the so-called bumpkin proletariat) and their efforts to maintain their economic livelihood. It is surely inadequate to say that environmentalists are not contributing to the economic insecurity of workers when jobs are being threatened as a result of environmentalist actions, with environmentalists as a whole doing very little directly to aid the workers caught in this situation. It is equally objectionable to complain about lack of “class consciousness” and an absence of resistance among workers while turning a blind eye to the concrete struggles actually taking place. Nor should one be overly hasty to condemn forest product workers, the majority of whom believe in promoting a sustainable relation to the forest at some level, for adhering to destructive attitudes toward the natural world.

Not just deep ecologists but also mainstream environmental groups commonly distance themselves from workers. Less inclined to adopt the language of class, the latter seldom express their disdain for workers as openly, but their “that’s not our problem” attitude—not to mention their interlocking directorates with major corporations and their white, upper middle-class membership base—suggest many of the same biases.

As the late Judi Bari, the leading figure within Earth First! in the 1990s wrote, one of the major obstacles to labor-environmentalism is “the utter lack of class consciousness by virtually all of the environmental groups”:

I have even had an international Earth First! spokesman tell me that there is no difference between the loggers and the logging companies! . . . I have heard various environmentalists say that working in the woods and mills is not an “honorable” profession, as if the workers have any more control over the corporations’ policies (or are gaining any more from them) than we do. As long as people on our side hold these views, it will be easy picking for the bosses to turn their employees against us.²⁷

The problem goes deeper than a mere failure of most environmental groups to align themselves with labor, however. When environmental organizations have sought to develop alliances with workers, they have often been targets of repression—emanating both from vested economic interests and the state. In May 1990 Judi Bari and Dale Cherney, both of whom had been involved in organizing the major environmental protest known as Redwood Summer, were injured and Bari nearly killed when a bomb that antienvironmental terrorists had placed under the driver’s seat of Bari’s car exploded. In a classic case of state repression, the FBI arrested Bari and Cherney for the bombing. They were later released.

Further, in those cases where forest ecosystem defenders and forest product workers have gotten together the mass media has provided very little coverage. In the words of longtime environmental activist Hazel Wolf, "As Secretary of the Seattle Audubon Society, I have attended joint environmental-labor press conferences that were poorly attended by the press and consequently ignored by the media. This is a story that is all too familiar and accounts for the success of the timber industry in driving a wedge between the environmentalists and loggers using the myth of jobs vs. owls."²⁸

The failure of most environmentalist groups to link their demands with those of workers in the industry is most evident in the reluctance to take sides in the fierce battle being waged between employers and employees in and around the Northwest forests. In the 1980s, forest product workers in the Northwest were hit by a process of industrial restructuring that seriously undermined their economic positions and their capacity to engage in effective class struggles. These included: (1) a drastic drop in housing starts; (2) increased exports of unprocessed logs coupled with rising excess capacity in Northwest mills; (3) a vastly stepped-up rate of imports of lumber from Canada (which had the effect of creating deep fissures between Canadian and U.S. workers within the International Woodworkers of America); (4) rapid declines in employment due to mechanization; (5) wage competition from Southern wood workers (who earned almost \$3 an hour less on average in 1986 than their Northwest counterparts); and (6) a general shift of the industry from the Northwest to the Southeast, where faster growing pine plantations and right to work laws provide a greater "comparative advantage" in timber production.

Of all of these factors affecting Northwest timber employment, automation has been the most important. In 1987, it took only eight workers to process one million board feet of timber, compared to ten workers a decade earlier. In 1976, a total of 15 bbf of timber was harvested from all sources in Oregon and Washington, giving employment to 150,900 workers in the lumber and wood products and paper and allied products industries. In 1989, the same total harvest level employed 135,700, or about 10 percent fewer workers. In Oregon, the state with the largest old-growth forests, employment in the lumber and wood products industries declined by 21.9 percent between 1978 and 1990, with 71 percent of this decline occurring between 1978 and 1988, before the northern spotted owl became a major issue.

Not surprisingly, capital chose this period to launch a wider class offensive. In 1983 Louisiana-Pacific demanded 8-10 percent rollbacks and the

creation of a two-tier wage structure at its 15 Northwest mills, forcing the unions to strike. With no agreement after a year, the union locals at Louisiana-Pacific's mills were decertified. In 1985, Weyerhaeuser demanded wage and benefit cuts of about \$4 an hour at a number of mills. When the unions resisted, the mills were closed. Having demonstrated its clout, Weyerhaeuser in 1986 was able to force an agreement with the unions that involved wage and benefit cuts of \$4 an hour plus the implementation of a complex "profit-sharing" scheme. Although strikes continued to break out at Northwest mills in the late 1980s, it was clear that the unions had suffered a great reversal in their class war with capital.²⁹

During these fierce battles between forest products firms and their workers, environmentalists were generally nowhere to be seen (with the exception of certain Earth First! activists like Judi Bari) and scarcely seemed to notice. Few in the Green movement saw this as an occasion to demonstrate their solidarity with workers. Indeed, middle-class environmentalists sometimes seem to go out of their way to separate themselves from workers.³⁰

The political and organizational consequences of this environmentalism without class, separating environmentalists from workers, is particularly evident at the grassroots in the Northwest. Today the conflict at the popular level in Oregon is visible more and more in terms of the opposition between two large coalitions: on the one side, the Oregon Natural Resources Council (ONRC), the most powerful regional environmental organization in the country, embracing some 6,000 members and representing some 80 different conservation groups; on the other side, the Oregon Lands Coalition (OLC), a predominantly conservative, proindustry coalition, embracing over 72,000 members and encompassing 47 different organizations. While the ONRC is closely tied through local chapters to such national conservation organizations as the Sierra Club, the Audubon Society, the Wilderness Society, and the National Wildlife Federation, the antienvironmentalist OLC has forged close links to Republican figures in the Northwest congressional delegation and to the American Forest Resource Alliance—as well as more tenuous relations with AFL-CIO locals (tenuous because of the reputed antiunion orientation of some OLC member organizations, such as the procapital Yellow Ribbon Coalition).

The deep divisions that have emerged in this way between the labor and ecology movements explain much of the success of the state—under both the Bush and Clinton administrations—in containing the environmentalist assault on the timber industry. Exploiting to the full the divisions among

popular forces, the Bush administration early on adopted a strategy of staving off the separate threats represented by environmentalists and workers to the interests of capital through a policy of divide and conquer. Thus, on the one hand, George Bush announced that he was concerned above all with the jobs of workers threatened by efforts to protect the endangered spotted owl: "We want to save the little furry-feathery guy and all that but I don't want to see 40,000 loggers thrown out of work."³¹ On the other hand, the administration had repeatedly let it be known that the President was opposed to special legislation designed to assist displaced workers.³²

Despite the release of the Thomas report in April 1990, and the listing of the northern spotted owl as a threatened species in June 1990, the executive branch ordered the Forest Service in the spring and summer of 1990 to stop working on an owl protection plan. At the same time, the White House suppressed a Forest Service/BLM report on the northern spotted owl that had come up with numerous ways to offset the job losses experienced by workers. According to what Democratic Congressional representative Peter DeFazio has called a "reliable source" in the Forest Service, the Forest Service/BLM study was killed by the administration. A May 1990 draft of the suppressed report contained over 52 pages of concrete recommendations, including an \$86 million public works program modeled after the Civilian Conservation Corps of the 1930s, bans on log exports "for all ownerships," increases in the share of revenues from timber sales to be returned to timber-dependent communities, extensive retraining programs, and money for road reclamation projects. Since this report pointed to the fact that a political solution to the crisis that would meet the needs of both environmentalists and workers was perfectly feasible, "someone in the White House, . . . I'd lay even money on John Sununu," DeFazio said, simply killed the report.³³

Overall, the Bush administration was clearly on the defensive on the owl question from the spring of 1990 to the spring of 1992, when the Lujan plan was released. Its initial strategy was to encourage the main federal agencies involved—the Forest Service, the Bureau of Land Management, and the Fish and Wildlife Service—to delay the adoption of plans to safeguard the northern spotted owl. Such delays would allow the timber companies to extract huge quantities of additional timber from the Northwest forest. For a year this delaying tactic seemed to work. But, beginning in April 1991, the administration strategy collapsed as federal courts (laying the blame on the Bush administration) ruled that the federal agencies were not in compliance with the law, with the result that bans were placed on

Forest Service (and later Bureau of Land Management) sales until agency plans to protect the owl were formulated and put into effect. From that point on, the Bush administration focused its efforts on the more aggressive strategy of undermining the long-awaited Fish and Wildlife Service recovery plan and the Endangered Species Act itself through the convening of the God Squad, and the launching of its own plan for slow extinction of the owl in the interest of greater timber extraction.

The demise of the Bush administration seemed to many to mark a turning point in the struggle to save the ancient forest. Not only had a new president been elected who promised to end the conflict, but the entire struggle, which had long centered on the preservation of the northern spotted owl, had been successfully transformed by environmentalists into the wider issue of the preservation of an entire ecosystem, with the listing of other Pacific Northwest species as threatened or endangered by the fall of 1992. In October 1992 the marbled murrelet, a tiny seabird that nests in the coastal old-growth forests of the Pacific Northwest, was listed as a threatened species. Although two-thirds of the murrelet's range overlapped with that of the northern spotted owl, the effect of this new listing meant that certain coastal forest areas not included in the set-asides for the owl were affected. Also in 1992 three wild salmon stocks (the spring, summer, and fall Snake River Chinook) were listed under the Endangered Species Act—with immediate significance for logging operations along the streams of Northwest national forests, where the salmon returned each year to spawn. This served to dramatize the fact that more than 100 generally recognized wild salmon stocks in the region were extinct, while most of the rest were in danger of extinction—with logging constituting one of the most important contributing factors, after dams. As a result of these developments the issue of the ancient forest came to be seen as related to the management of entire watersheds, making it clear that it was no longer a question of the northern spotted owl alone, but rather a matter of life and death for numerous species within the Pacific coast bioregion.³⁴

If these developments generated a period of great expectations on the part of environmentalists engaged in the struggle for the ancient forest, this was soon to change to one of deep disappointment, even anguish. After presiding over a forest summit in Portland, Oregon, and considering eight options to deal with the crisis of the ancient forest and the threat to the existence of such endangered species as the spotted owl and Pacific coast salmonids, President Clinton decided that none of these permitted

enough logging to take place, which led to the development of the Clinton forest plan, based on the notorious Option Nine. As Alexander Cockburn and Ken Silverstein have written:

While Option Nine reduced the amount of logging allowed on national forests, it failed to set aside any permanently protected old-growth forest preserves, and permitted clear-cutting in the most ancient groves and in the most vital spotted owl and salmon habitat. In fact the environmental analysis accompanying Option Nine admits that this strategy places hundreds of species at increased risk of extinction, including the spotted owl, marbled murrelet, and dozens of stocks of Pacific salmon and steelhead.

The little that the administration did for workers, such as its much promoted "Jobs in the Woods" program, proved to be woefully inadequate. According to the Pacific Rivers Council, an environmental organization involved in the program, Jobs in the Woods, despite very limited funding and other constraints, "got characterized [misleadingly] as an employment program, bringing first false hopes and later frustration and anger to dislocated workers and community leaders who thought they would see immediate benefits."³⁵

The biggest disappointment for environmentalists came with President Clinton's signing of the notorious salvage logging rider to the Budget Rescissions Bill in July 1995. Only two months earlier Clinton had condemned the salvage rider for provisions that "would basically direct us to make timber sales to large companies, subsidized by taxpayers, . . . [and] that will essentially throw out all of our environmental laws and the protections we have that surround such timber sales." Rather than veto the Budget Rescissions Bill (a second time), the president, however, signed it into law, and the salvage rider, now in effect, required the release of nearly a billion board feet of timber sales in the ancient forest of Oregon and Washington that had been held back because of environmental laws, including those sales that threatened such endangered species as the northern spotted owl, the marbled murrelet, and Pacific salmon stocks. In this way around 180 timber sales in Oregon and Washington with high environmental impact were mandated by Congress and the president. Some proponents of this legislation, such as U.S. Senator Slade Gorton (R-WA), did not hesitate to explain that economic motives dominated ecological ones. "There comes a time," he has long contended, "when you just have to say enough is enough, and let a species go extinct." In a major giveaway to business at the expense of taxpayers in general, the rider required the Forest Service to price the sales at 1990 price levels.

In the case of the marbled murrelet the sales demanded by the salvage rider encompassed 15 percent of the murrelet's remaining habitat, with murrelet populations expected to drop by a similar fraction as a result. The danger to the murrelet is particularly great because 59 of the sales mandated by the rider are within the Siuslaw National Forest where the best unfragmented old-growth forest, making up the murrelet's habitat, is to be found, and where most of the murrelet population resides. Consequently, the marbled murrelet, as Scott Greacen of *Wild Forest Review* has written, seems "doomed by greed."³⁶

With a new assault on the forest taking place the front line of the environmental struggle shifted to the militant environmental activists of the direct action groups like Earth First! In the sugarloaf area of the Siskiyou National Forest environmental activists seeking to defend 669 acres of old-growth confronted the U.S. Forest Service, police, and Boise Cascade, resulting in numerous arrests beginning in October 1995 and the largest instance of environmental disobedience in Oregon history. Similar confrontations occurred in the Umpqua National Forest, where, day after day, protesters from Earth First!, Cascadia Forest Defenders, Siskiyou Forest Defenders and other groups attempted to halt logging with car blockades and other work interferences in the spring of 1996. Meanwhile, in an attempt to prevent the logging of the Warner Creek area in the Willamette National Forest Earth Firsters built road blockades, complete with a stockade and moat, and dug in on a long-term basis. The standoff ended 11 months into the blockade, after the Clinton administration announced in late July 1996 that Warner Creek would not be logged under the salvage rider and that an attempt was being made to swap the Warner Creek timber sale (made to the Thomas Creek Lumber and Log Co.) for another timber sale. Nevertheless, environmentalists—still on their guard—continued to occupy the site. In mid-August 1996 federal officials moved in, closing off the entire area to the public and denying access to the media. They then proceeded to bulldoze "Fort Warner," arresting five protesters along with two reporters from the major regional paper, the *Eugene Register-Guard*, for trespass. Strong-arm tactics by law enforcement authorities included keeping the two journalists handcuffed for three hours (detaining them for six) while seizing their film and notes, which were then developed and copied—all clearly in violation of federal and state constitutional guarantees protecting freedom of the press.³⁷

Despite such militancy, environmentalists seeking to preserve the old-

growth forest are clearly on the defensive at present, and the reasons why are not difficult to discern. A fairly organized antienvironmental backlash has developed over the past few years, rooted in the Wise Use movement based in the West. Wise Use backers, as earlier noted, consist mainly of officers from resource-extracting corporations, small landowners, sawmill owners, ranchers, farmers, and mining interests, with some support among workers in the timber and mining industries. Among their goals are clear-cutting wilderness areas, protection of grazing rights, deregulation of mining, exemption of private lands from environmental regulations (and compensation for any "takings" resulting from such regulations), and the selling off of large tracts of public land to the highest bidders. It is no secret that the Wise Use movement is bankrolled by corporations; thus, People for the West! relied on corporations for 95 percent of its 1990 budget. Nevertheless, the Wise Use movement has a grassroots basis. As Mark Dowie explains in his book *Losing Ground*, Wise Use activists

are organizing in the mostly rural communities while the mainstream environmental movement continues to rely for its support on the mailing lists of liberal magazines, suburban charities, and other environmental organizations. . . . However deceptive it may be, the appeal of the Wise Use message is very real to hard-working farmers, loggers, and miners—the very people environmentalism needs to reach if it is to survive as a relevant and effective movement, particularly in the West.³⁸

Put simply, the success of the Wise Use movement can be attributed in part to the failure of big environmentalism (and big labor) to forge a strong labor-environmentalist alliance. All of this suggests that the time when environmentalism could prosper as a single-issue movement ignoring issues of class (and issues of race, gender, and international inequality) is clearly over.

Toward a Strategy of Ecological Conversion

If the foregoing analysis is correct and the environmentalist cause has been impeded by the executive arm of the state acting in tandem with the large corporations, while workers and endangered species are being forced to bear the main costs of the crisis, it is essential for environmentalists and workers to join forces around a common platform. A progressive class-oriented response to the old-growth crisis would have to focus on an ecological conversion program that could be enacted at the level of the state. As Victor Wallis has argued, the term "*conversion* . . . has traditionally referred to the switch from a military to a civilian economy." But the concept can be

applied more broadly to the socially planned redirection of the economy necessary to create a sustainable society.³⁹

There is no doubt that an ecological conversion strategy of this sort could be adopted in relation to the old-growth forest crisis. Moreover, there are progressive, ecologically concerned voices within the workers' movement who would back such a strategy. This is illustrated by the position taken by William Street, a policy analyst for the International Woodworkers of America (IWA). Writing in May 1990 in his column in the IWA's paper, *The Woodworker*, Street explains:

We . . . know . . . a worker's forest policy . . . starts by recognizing the need for a sustainable and renewable forestry. It recognizes that each portion of the planet must produce its proportional share of the resources it uses. The proportion should be produced as environmentally sound as possible. . . . A worker's forest policy would harvest at a sustainable rate and insure that those mature trees that are harvested are used for those socially desired products for which there are no substitutes. By thus restricting the use of older trees, harvest pressure would be diminished without contributing to unemployment.⁴⁰

This position taken by a progressive figure within a forest product union does not represent a solution to the tragedy of the ancient forest, since it does not fully take into account the fragility of the remaining old-growth forest. Yet it represents a view that includes ecological and social components that are crucial to any attempt both to save the forest and the safeguard the livelihood of workers. It constitutes a viewpoint, moreover, that is a far cry from those that single-issue environmentalists often attribute to workers.

One thing that Street's "worker's forest policy" makes clear is that, once the narrow profit-making goals of corporations are no longer seen as the primary constraint in working out solutions to problems of the environment and employment, all sorts of new rational possibilities open up, allowing for the development of common ground between workers and environmentalists. Clear-cutting could conceivably be replaced by the "new forestry" techniques promoted by ecologist Jerry Franklin, in which the aim is to mimic natural processes by leaving behind large standing trees, snags, and fallen trees. Restrictions could be placed on the uses to which mature timber could be put—so that old-growth could not be logged and then pulped to be converted into products like disposable diapers. Highgrading, or the selective cutting of the oldest and most valuable timber alone, could be prohibited. The use of herbicides and the burning of slash could be eliminated. Current bans on federal log exports could be followed up by bans (or export duties)

on private log exports. Early-retirement programs could be designed for older workers in the industry, coupled with guaranteed annual employment programs for those in the smaller work force that remains. Larger shares of forest revenues could be returned to local communities. A Civilian Conservation Corps could be established to construct recreation facilities and carry out ecological restoration projects in the forests. Roads could be reclaimed in habitat conservation areas. Conversion funds could be provided to convert old-growth sawmills into more modern plants equipped to process second growth. A windfall profits tax could be placed on timber corporations that see the value of the timber on their tree plantations rise as a result of curtailments of public timber supplies. Extensive education and retraining programs (a workers' GI Bill) could be established for displaced forest product workers. Economic development grants and loans could be made available to distressed communities. Federal programs could be developed to help manage timber more effectively on nonindustrial private forest lands. Current federal timber contract practices could be altered to ensure that timber would be sold at its full value and to decrease speculative purchases. Federal subsidies to timber capital through road-building budgets could be sharply curtailed and the freed-up funds redirected to social services in timber communities. Funds could be allocated for the expansion of national forest lands to be managed on a nonprofit, ecologically sustainable basis, with revenues from the land base being used to support working communities. Finally, international agreements could be promoted to establish uniform practices of sustainable forestry and to reduce global competitive pressures that encourage deforestation and forest fragmentation.

What is important to recognize is that only a few relatively minor steps in this general direction would go a long way toward solving the employment problem and community instability caused by the "set-asides" for the protection of the northern spotted owl. A unified labor-environmentalist strategy that would meet the needs of both the forest ecosystem and forest communities is therefore perfectly feasible. What is necessary to make this possible is for society to invest some of its economic surplus in assisting workers whose jobs and communities are being undermined by new ecological requirements.

Unfortunately, people such as William Street are somewhat isolated within union circles, and organized labor in the Northwest has been reluctant to put its full weight behind ecological conversion (or industrial transition) programs when limited efforts have been made in this direction, since this is

seen as an unnecessary concession to preservationists who wish to reduce logging levels. A sign of the times is that Irv Fletcher, president of the Oregon AFL-CIO, threatened U.S. representative Elizabeth Furse (D-OR) with withdrawal of support for her reelection if she continued to oppose the salvage logging rider.⁴¹ Matters are made still worse by the fact that the major environmental organizations have shown little direct concern for the plight of the workers and have only recently begun to think in a rather modest fashion about industrial transition.

Under these circumstances, it is perhaps not surprising that the labor unions themselves have been overshadowed in this area by conservative coalitions that are unabashedly antipreservationist and procapital. Thus, when the God Squad announced in May 1992 that it would exempt 13 BLM sales from the Endangered Species Act, a representative of the Oregon Lands Coalition was quoted as saying, "This decision is a victory for the workers of Oregon, however small it may be." What is noteworthy about this statement is not so much the position taken as the fact that a conservative, probusiness, and antienvironmentalist citizen's alliance such as the Oregon Lands Coalition (which includes groups such as cattle grazers and realtors, as well as the antiunion, grassroots timber industry organization, the Yellow Ribbon Coalition, in its membership) should become—in the absence of a progressive trade union response to the crisis—the main voice for the "workers of Oregon" on the old-growth question.

This failure of the regional unions to push hard for an ecological conversion program is partly explained by the fact that such a program is an extremely difficult strategy for unions in a natural resource industry in an out-of-the-way area of the country to pursue on their own—particularly under circumstances of a declining natural resource base, economic crisis, capital relocation, union decline, and growing environmental controls. Ultimately, the pursuit of an ecological conversion strategy requires not imaginative initiatives in a depressed community so much as coordinated action on a national scale, and this involves finding the means to force the channeling of economic surplus into ecological conversion programs throughout the country. That sufficient surplus for this purpose exists can scarcely be doubted.⁴² Recognizing this, the Oil, Chemical and Atomic Workers Union has proposed the creation of a "Superfund for Workers" that would offer up to four years of support to people displaced by environmentally destructive industries in order to enable them to pursue vocational retraining, or even an entire career shift by means of extended education. Other possible variations on this

Workers' Superfund program include assistance to help form small businesses and income supplements for individuals who decide to pursue less well paid work. The annual cost for a million workers might be \$40 billion.⁴³

The actual trend in the United States in recent years, however, has been in the opposite direction—toward less and less support for displaced workers. Federal outlays for worker retraining are far below what they were when Reagan was first elected. Under these circumstances, workers end up carrying a larger and larger share of the total cost to society of industrial transition. In 1987, public spending on employment and retraining as a percentage of Gross Domestic Product (GDP) was 1.7 percent in Sweden, 1 percent in West Germany, 0.7 percent in France, Spain, and Britain, and a minuscule 0.3 percent in the United States.⁴⁴

This situation is a problem not simply for workers and trade unions but for any environmental movement worthy of its name. Capitalism as a system devoted to accumulation without end is inseparable from a capital-intensive, energy-intensive economy—and thus necessitates growing throughputs of raw materials and energy, along with the creation of excess capacity, surplus labor, and economic and ecological waste. This should be differentiated from the basic needs of the broad majority of people, which have to do with the availability of steady and worthwhile employment and an improving quality of life, therefore having no inherent link to an intensive process of ecological degradation. Northwest timber workers, for their part, want above all to protect their livelihood and communities. In this respect the export of unprocessed logs, the relentless drive for ever higher levels of automation, the emphasis on clear-cutting as opposed to “new forestry,” the use of chemical weed killers, the burning of slash, and so on, make no sense from a worker's standpoint.

The “job blackmail” that often seems to compel workers to adopt an antienvironmental stance can therefore be seen to be tied to a system that promotes profits by means of the exploitation of both human beings and nature.⁴⁵ The direct route to the creation of a mass environmental movement is one that seeks to break the seemingly intractable conflict between jobs and environmental protection (a conflict symbolized nowadays by owls versus jobs) by placing ecological conversion—the planning of new ways of working with nature while fulfilling social needs—at the very core of each and every ecological struggle. This necessarily means moving away from the attitude that environmentalism can somehow stand above and beyond the class struggle.

A shift toward a broad movement for ecological conversion and the creation of a sustainable society also means that the partnership between the state and the capitalist class, which has always formed the most important linchpin of the capitalist system, must be loosened by degrees, as part of an overall social and environmental revolution. This partnership must be replaced, in the process of a radical transformation of the society, by a new partnership between democratized state power and popular power.⁴⁶ Such a shift requires revolutionary change that must be more than simply a rejection of capitalist methods of accumulation and their effects on people and the environment. Socialism—as a positive, not just a negative, alternative to capitalism—remains essential to any conversion process, because its broad commitment to worldwide egalitarian change reflects an understanding of “how the needs of the various communities can fit together in a way that leaves nobody out, and that also satisfies global environmental requirements. Within a socialist framework, the sources of the largest-scale and most severe environmental destruction could be dealt with head-on, in a way that has already shown itself to be beyond the capacity—not to say against the interests—of capital.”⁴⁷

From an eco-socialist perspective there is no difficulty in seeing that the rapid destruction of the old-growth forest is not about owls versus jobs but ecosystems versus profits. Ecology tells us that the destruction of a complex ecosystem rooted in a climax forest that took centuries and even a millennium or more to develop involves thresholds beyond which ecological restoration is impossible. We must therefore find our way to a more rational economic and social formation, one that is not based on the amassing of wealth at the expense of humanity and nature, but on justice and sustainability. Whether the issue is species extinction, death on the job, women’s control of their own bodies, the dumping of toxic wastes in minority communities, urban decay, Third World poverty, the destruction of the ozone layer, global warming, nuclear contamination, desertification, soil erosion, or the pollution of water resources, the broad questions and answers remain the same. As the authors of *Europe’s Green Alternative* have written, we must choose between two logics: “on the one side, economics divorced from all other considerations, and on the other, life and society.”⁴⁸

1 Quoted in Martin Ryle, *Ecology and Socialism* (London: Century Hutchinson Ltd. 1988), p. 13. See also John Bellamy Foster, “Britain’s Green Budget,” *Capitalism, Nature, Socialism*, 3(2), June 1992.

- 2 See John Bellamy Foster, "The Absolute General Law of Environmental Degradation under Capitalism," *Capitalism, Nature, Socialism*, 3: 3, 1992.
- 3 For an earlier essay on which portions of the following argument are based, see John Bellamy Foster, "Capitalism and the Ancient Forest," *Monthly Review*, 43: 5, October 1991.
- 4 Michael Renner, "Creating Sustainable Jobs in Industrial Countries," in Lester R. Brown et al., *The State of the World 1992* (London: Earthscan, 1992), p. 138.
- 5 Peter Morrison, in Joint Hearings, Subcommittee on Forests, Family Farms, and Energy of the Committee on Agriculture, and the Subcommittee on National Parks and Public Lands of the Committee on Interior and Insular Affairs, U.S. House of Representatives, U.S. Congress, 101st Congress, First Session, *Management of Old-Growth Forests of the Pacific Northwest*, June 20 and 22, 1989 (Washington, D.C.: U.S. Government Printing Office), pp. 270-8; *Portland Oregonian*, October 15, 1990; Tucker, quoted in *New York Times*, June 11, 1992. The Peter Morrison/Wilderness Society estimate, based on the analysis of satellite pictures, takes account of the extreme fragmentation of these forests. Other estimates, including some by the Wilderness Society, that are broader and less rigorous in their methodology have placed the remaining old-growth forest acreage as high as 4.7 million acres or more (World Resources Institute, *The 1992 Information Please Environmental Almanac* [Boston: Houghton Mifflin, 1992], pp. 143-5). The crazy quilt pattern of the forest was partly the result of railroad land grants, which had given every other square mile of land along the path of the railroads to private railroad interests, resulting eventually in a checkerboard pattern of public and private forest lands. See Derrick Jensen and George Draffen, *Railroads and Clearcuts* (Spokane, WA: Inland Empire Lands Council, 1995).
- 6 For the larger theoretical significance of this see James O'Connor, "Capitalism, Nature, Socialism: A Theoretical Introduction," *Capitalism, Nature, Socialism*, 1, Fall, 1988.
- 7 R. H. Waring and J. F. Franklin, "Evergreen Coniferous Forests of the Pacific Northwest," *Science*, 204, 1979; Elliot A. Norse, *Ancient Forests of the Pacific Northwest* (Washington, D.C.: Island Press, 1990), pp. 20-4, 27-32, and 141-4; Catherine Caufield, "The Ancient Forest," *New Yorker*, May 14, 1990, pp. 46-9; David Kelly and Gary Braasch, *Secrets of the Old-Growth Forest* (Salt Lake City: UT Peregrine Smith Books, 1988), pp. 21, 36-7, and 63; and Chris Maser, *The Redesigned Forest* (San Pedro, CA: R & E Miles, 1988), p. 53.
- 8 Carolyn Merchant, *Ecological Revolutions* (Chapel Hill: University of North Carolina Press, 1979), p. 5.
- 9 Lujan quoted in Jonathon King, *Northwest Greenbook* (Seattle, WA: Sasquatch Books, 1991), p. 53; and Southern Forest Products Association, *Newsletter*, October 7, 1991.
- 10 *Eugene Register-Guard*, May 15 and 24, 1992; *Portland Oregonian*, May 15 and 17, 1992.
- 11 Ralph Miliband, *Divided Societies* (New York: Oxford University Press, 1991), pp. 30-4.
- 12 Jeffrey St. Clair, "Any Which Way You Cut It," *Wild Forest Review*, 1: 4, March 1994, p. 14; Jeffrey St. Clair, "Clinton and the Ancient Forests," *Lies of Our Times*, 5 (3), March 1994, p. 14; and Jeffrey St. Clair, "Salvage Dreams," *Wild Forest Review*, 3: 1, January/February 1996, p. 13.
- 13 For the notion of the "natural resource state" organized in the United States around

- the Department of Interior in particular, see Christopher Manes, *Green Rage* (Boston: Little, Brown, 1990).
- 14 Edward Goldsmith et al., *The Imperiled Planet* (Cambridge, MA: MIT Press, 1990), p. 94; and Richard E. Rice, "Old-Growth Logging Myths," *The Ecologist*, 20: 4, July-August 1990, pp. 143-5.
 - 15 Spider Burbank et al., *A Study of the Weyerhaeuser Company as a Multinational Corporation* (Olympia, WA: The Evergreen State College, June 1975), p. 1; and Thorstein Veblen, *Absentee Ownership and Business Enterprise in Recent Times* (New York: A. M. Kelley, 1923), p. 194.
 - 16 David A. Clary, *Timber and the Forest Service* (Lawrence: University Press of Kansas, 1986), pp. 80-93 and 110-1; William B. Greeley, *Forests and Men* (Garden City, NY: Doubleday, 1951), p. 206; Con H. Schallau, "Sustained Yield versus Community Stability," *Journal of Forestry*, 87: 9, September 1989, p. 18; Keith Ervin, *Fragile Majesty* (Seattle, WA: The Mountaineers, 1989), p. 123; and Daniel R. Barney, *The Last Stand* (New York: Grossman, 1974), pp. 88-9.
 - 17 U.S. Forest Service, Pacific Northwest Research Station, *Production, Prices, Employment and Trade in Northwest Forest Industries*, various issues; Marcus Widenor, "Pattern Bargaining in the Pacific Northwest Sawmill Industry: 1980-1989," in Steven Hecker and Margaret Hallock, eds., *Labor in a Global Economy* (Eugene: University of Oregon, Labor Education and Research Center, 1991); and Widman Management Limited, *Markets 89-93: The Outlook for North American Forest Products* (San Francisco: Widman Management, 1989), pp. 79, 107.
 - 18 John Crowell, "Excerpts from a Speech by John B. Crowell, Jr.," in Bureau of Governmental Research and Service, University of Oregon, *Old Growth Forests: A Balanced Perspective* (Eugene: University of Oregon, 1982), pp. 133-6.
 - 19 Quoted in *Portland Oregonian*, October 15, 1990. Crowell's position, while extreme, reflects the dominant Forest Service/timber industry view that a steady or even accelerated cutting of old growth in the national forests is necessary to close the "window" of a temporary shortage of timber, brought on in the past few decades by past failures of forest management and the slow growth of trees in the Northwest. This window, it is believed, will be closed in the first quarter of the twenty-first century when enough second-growth timber will be available to sustain production indefinitely—a point that will be reached, however, only when all of the old growth in the national forests has been removed and the entire timber economy had been put on a fully commodified, tree plantation basis. In federal forest management this approach is justified as broadly consistent with "sustained yield" forestry. In practice, however, it has little to with sustainability in either ecological or economic terms, and has become little more than an additional rationale for pursuing timber capital's age-old policy of cutting as much timber as the market will bear.
 - 20 Caufield, *The Ancient Forest*, pp. 69-70.
 - 21 Joe P. Matthey, *The Timber Bubble That Burst* (New York: Oxford University Press, 1990), pp. 3-9; and *Portland Oregonian*, October 15, 1990.
 - 22 *Eugene Register-Guard*, May 24, 1992.
 - 23 *Eugene Register-Guard*, October 26, 1992.

- 24 Manes, *Green Rage*, pp. 10-5, 86-8, 99-102, and 210-1. Tree spiking is extremely controversial since it is life threatening to workers, who can be injured or killed when saw blades come into contact with the spike. Since March 1990, when Judi Bari publicly renounced tree spiking at an Oregon conference at the urging of timber worker Gene Lawhorn, Earth Firsters in the Northwest have repeatedly repudiated this tactic. See Rik Scarce, *Eco-Warriors* (Chicago: Noble Press, 1990), pp. 74-8, and Clay Dumont, *Loggers and Radical Environmentalists: Cultural Struggles in Timber Country* (Ph.D. dissertation, University of Oregon, 1991), pp. 79-84 and 135-7.
- 25 Native Forest Council, *Forest Voice*, 2: 2, 1990, p. 5. See also Dumont, *Loggers and Radical Environmentalists*, pp. 85-91.
- 26 Dave Foreman in Steve Chase, ed., *Defending the Earth: A Dialogue between Murray Bookchin and Dave Foreman* (Boston: South End Press, 1991), pp. 51-2. Not all within Earth First! would agree with Foreman's point of view. Judi Bari is the most famous of those Earth Firsters who have adopted a labor-environmentalist stance. On Bari's ideas and position within the movement, see Scarce, *Eco-Warriors*, pp. 80-5, and Timothy Leigh Ingalsbee, *Earth First!: Consciousness in Action in the Unfolding of a New Social Movement* (Ph.D. dissertation, University of Oregon, June 1995).
- 27 Judi Bari, *Timber Wars* (Monroe, ME: Common Courage Press, 1994), p. 14.
- 28 Ibid., pp. 286-328; David Helvarg, *War against the Greens: The "Wise Use" Movement, the New Right and Anti-Environmental Violence* (San Francisco: Sierra Club Books, 1994), pp. 331-9; and Hazel Wolf, "Relief for Unemployed Timber Workers," *Monthly Review*, 43: 9, February 1992, pp. 46-7. On the repressive role of the state, see Michael Parenti, "Popular Sovereignty vs. the State," *Monthly Review*, 46: 10, March 1995, pp. 11-16. Not just environmentalists but workers too have been subject to repression when they have attempted to build a common cause with environmentalists. On this the case of Bari's ally, former mill worker Gene Lawhorn, is instructive; see Helvarg, *War against the Greens*, pp. 112-7.
- 29 Renner. "Creating Sustainable Jobs . . .," pp. 150-1; U.S. Forest Service, Pacific Northwest Research Center, *Production, Prices, Employment and Trends; Eugene Register-Guard*, May 3, 1991; Widenor, *Pattern Bargaining*, pp. 252-61. For examples of certain tentative attempts by Earth Firsters to take action in support of workers, see Ingalsbee, pp. 361-6.
- 30 For example, in their popular ecological photo essay, David Kelly and Gary Braasch falsely glorify environmentalists as a nature-loving "bourgeoisie," which "donned backpacks *en masse* and headed for the hills, where they discovered the environment was in trouble" (Kelly and Braasch, *Secrets of the Old-growth Forest*, pp. 57-9).
- 31 Quoted in the *Times* (London), May 28, 1992.
- 32 On administration opposition to special assistance for the displaced workers, see the *Christian Science Monitor*, June 6, 1991.
- 33 U.S. Forest Service and Bureau of Land Management, *Actions the Administration May Wish to Consider in Implementing a Conservation Strategy for the Northern Spotted Owl*, unpublished, May 1, 1990; and *Eugene Register-Guard*, May 4, 1991.
- 34 Andy Kerr, "Saving Pacific Salmon," *Wild Fish*, May/June 1993, p. 3.
- 35 Alexander Cockburn and Ken Silverstein, *Washington Babylon* (London: Verso, 1996),

- p. 221; and Pacific Rivers Council, *Analysis and Recommendations for the Federal Land Jobs in the Woods Program* (Eugene, OR: Author, March 1995), p. 15.
- 36 President Clinton quoted in Stephen T. Taylor, "Blame the Democrats," *Washington Post*, October 29, 1995; Jeffrey St. Clair, "Salvage Dreams," *Wild Forest Review*, 3: 1, February 15, 1996, pp. 8-21; Jeffrey St. Clair and Scott Greacen, "(K) Is for Killer," *Wild Forest Review*, February 15, 1996, pp. 22-5; and Scott Greacen, "Bye Bye Birdie," *Wild Forest Review*, February 15, 1996, pp. 26-8.
- 37 Cimmaron and Raven, "Umpqua Ancient Forest Spared," *Earth First!*, 16(5), May 1996, p. 11; John Green, "Warner Creek," *Earth First!*, 16: 6, June 1996, p. 9; and *Eugene Register-Guard*, August 18, 1996.
- 38 Mark Dowie, *Losing Ground* (Cambridge, MA: MIT Press, 1995), pp. 93-8 and 101-3. For a fuller development of the argument on the Wise Use movement presented in this chapter, see John Bellamy Foster, "Wise Use and Workers," *Dollars & Sense*, March/April 1996, p. 7.
- 39 Victor Wallis, "Socialism, Ecology and Democracy," *Monthly Review*, 44: 2, June 1992, pp. 15-8. See also Raymond Williams, "Socialism and Ecology," in *Resources of Hope* (London: Verso, 1989).
- 40 Raymond William Street, "Ecology Is Not a Four Letter Word," *The Woodworker*, May 20, 1990. Since the original version of this essay was written the IWA, once one of the great radical unions of the West Coast, has closed down due to declining membership—a symptom of the larger crisis of the industry.
- 41 Fletcher quoted in St. Clair, "Salvage Dream," pp. 19-20.
- 42 See Michael Dawson and John Bellamy Foster, "The Tendency of the Surplus to Rise, 1963-1988," in John B. Davis, ed., *The Economic Surplus in the Advanced Economies* (Brookfield, VT: Edward Elgar, 1992), pp. 42-70. An abbreviated version of this research appeared under the same title in *Monthly Review*, 43: 4, September 1991, pp. 37-50.
- 43 Renner, "Creating Sustainable Jobs . . .," pp. 153-4.
- 44 Ibid.
- 45 Renner, "Creating Sustainable Jobs . . .," p. 139.
- 46 Miliband, *Divided Societies*, pp. 228-9 and 233.
- 47 Wallis, "Socialism, Ecology and Democracy," pp. 16-7.
- 48 Penny Kemp et al., *Europe's Green Alternative: A Manifesto for a New World* (London: Merlin Press, 1992), p. 16.

11 — Malthus's Essay on Population at Age 200

Since it was first published 200 years ago in 1798, no other single work has constituted such a bastion of bourgeois thought as Thomas Malthus's *Essay on the Principle of Population*. No other work was more hated by the English working class, nor so strongly criticized by Marx and Engels. Although the Malthusian principle of population in its classic form was largely vanquished intellectually by the mid-nineteenth century, it continued to reemerge in new forms. In the late nineteenth century it took on new life as a result of the Darwinian revolution and the rise of social Darwinism. And in the late twentieth century Malthusianism reemerged once again in the form of neo-Malthusian ecology.

Today Malthus is commonly presented as an ecological thinker—counterposed to a classical Marxist theoretical tradition which (in large part because of its opposition to Malthus himself) is branded as anti-ecological. Hence, even some ecological socialists, such as Ted Benton, have gone so far as to argue that Marx and Engels were guilty of “a Utopian overreaction to Malthusian epistemic conservatism” which led them to downplay (or deny) “any ultimate natural limits to population” and indeed natural limits in general. Faced with Malthusian natural limits we are told, Marx and Engels responded with “Prometheanism”—a blind faith in the capacity of technology to overcome all ecological barriers.¹

It therefore seems appropriate, on the bicentennial of Malthus's *Essay on Population*, to reconsider what Malthus stood for, the nature of Marx's and Engels's response, and the relation of this to contemporary debates about ecology and society. Contrary to most interpretations, Malthus's theory was not about the threat of “overpopulation,” which may come about at some future date. Instead, it was his contention that there is a constant pressure of population against food supply that has always applied and will always apply. This means that there is effectively no such thing as “overpopulation” in the conventional sense. Engels was perfectly correct when

he wrote in 1844 that according to the logic of Malthus's theory "the earth was already over-populated when only one man existed."² Far from being an ecological contribution Malthus's argument was profoundly non-ecological (even anti-ecological) in nature, taking its fundamental import from an attempt to prove that future improvements in the condition of society, and more fundamentally in the condition of the poor, were impossible.

Malthus's *Essay on Population* went through six editions in his lifetime (1798, 1803, 1806, 1807, 1817, and 1826). The 1803 edition was almost four times as long as the first edition while excluding large sections of the former. It also had a new title and represented a shift in argument. It was therefore in reality a new book. In the subsequent editions, after 1803, the changes in the text were relatively minor. Hence, the 1798 edition of his essay is commonly known as the *First Essay* on population, and the 1803 edition (together with the editions of 1806, 1807, 1817, and 1826) is known as the *Second Essay*. In order to understand Malthus's overall argument it is necessary to see how his position changed from the *First Essay* to the *Second Essay*.³

The First Essay

The full title of the *First Essay* was *An Essay on the Principle of Population as It Effects the Future Improvement of Society; with Remarks on the Speculations of Mr. Godwin, M. Condorcet and Other Writers*. As the title indicates it was an attempt to intervene in a debate on the question of the future improvement of society. The specific controversy in question can be traced back to the publication in 1761 of a work entitled *Various Prospects of Mankind, Nature, and Providence* by Robert Wallace, an Edinburgh minister. Wallace, who in his earlier writings had demonstrated that human population if unchecked tended to increase exponentially, doubling every few decades, made a case in *Various Prospects* that while the creation of a "perfect government" organized on an egalitarian basis was conceivable, it would be at best temporary, since under these circumstances "mankind, would encrease so prodigiously that the earth would at last be overstocked and become unable to support its inhabitants." Eventually, there would come a time "when our globe, by the most diligent culture, could not produce what was sufficient to nourish its numerous inhabitants." Wallace went on to suggest that it would be preferable if the human vices, by reducing population pressures, should prevent the emergence of a government not compatible with the "circumstances of Mankind upon the Earth."⁴

Wallace's argument was strongly opposed by William Godwin in his Enlightenment utopian argument for a more egalitarian society, which he enunciated in his *Enquiry Concerning Political Justice and Its Influence on Morals and Happiness*. First published in 1793, it was followed by a second edition in 1795 and a third edition in 1798 (the year that Malthus's essay appeared). In answer to Wallace, who had claimed that excessive population would result eventually from any perfect government, thus undermining its existence, Godwin contended that human population "will perhaps never be found in the ordinary course of affairs, greatly to increase, beyond the facility of subsistence." Population tended to be regulated in human society in accordance with conditions of wealth and wages. "It is impossible where the price of labour is greatly reduced, and an added population threatens still further reduction, that men should not be considerably under the influence of fear, respecting an early marriage, and a numerous family." For Godwin there were "various methods, by the practice of which population may be checked; by the exposing of children, as among the ancients, and, at this day, in China; by the art of procuring abortion, as it is said to subsist in the island of Ceylon . . . or lastly, by a systematical abstinence such as must be supposed, in some degree, to prevail in monasteries of either sex." But even without such extreme practices and institutions, "the encouragement or discouragement that arises from the general state of a community," he insisted, "will probably be found to be all-powerful in its operation."⁵

Malthus set out to overturn Godwin's argument by changing the terrain of debate. Rather than contending, like Wallace before him, that a "perfect government" would eventually be undermined by the overstocking of the earth with human inhabitants, Malthus insisted that there was a constant tendency toward equilibrium between population and food supply. Nevertheless, population tended naturally when unchecked to increase at a geometrical rate (1, 2, 4, 8, 16), while food supply increased at best at an arithmetical rate (1, 2, 3, 4, 5). Under these circumstances attention needed to be given to the checks that ensured that population stayed in equilibrium (apart from minor fluctuations) with the limited means of subsistence. These checks, Malthus argued, were all reducible to vice and misery, taking such forms as promiscuity before marriage, which limited fecundity (a common assumption in Malthus's time), sickness, plagues, and—ultimately, if all other checks fell short, the dreaded scourge of famine. Since vice and misery were necessary at all times to keep population in line with

subsistence, any future improvement of society, as envisioned by thinkers like Godwin and Condorcet was impossible.

Malthus himself did not use the term “overpopulation” in advancing his argument—though it was used from the outset by his critics.⁶ Natural checks on population were so effective, in Malthus’s late-eighteenth-century perspective, that overpopulation, in the sense of the eventual overstocking of the globe with human inhabitants, was not the thing to be feared. The problem of an “overcharged population” existed not at “a great distance” (as Godwin had said), but rather was *always* operative, even at a time when most of the earth was uncultivated. In response to Condorcet he wrote, “M. Condorcet thinks that it [the possibility of a period arising when the world’s population has reached the limits of its subsistence] cannot . . . be applicable but at an era extremely distant. If the proportion between the natural increase of population and food which I have given be in any degree near the truth, it will appear, on the contrary, that the period when the number of men surpass their means of subsistence [in later editions this was changed to “easy means of subsistence”—see note 6 below] has long since arrived, and that this necessary oscillation, this constantly subsisting cause of periodical misery, has existed ever since we have had any histories of mankind (*First Essay*, pp. 120, 124, 134).” In the 1803 edition of his work on population he wrote, “Other persons, besides Mr. Godwin, have imagined that I looked to certain periods in the future when population would exceed the means of subsistence in a much greater degree than at present, and that the evils arising from the principle of population were rather in contemplation than in existence; but this is a total misconception of the argument, (*Second Essay*, vol. 1, p. 329).”

For Malthus, relatively low or stagnant population growth was taken as a sign of population pressing on the means of subsistence; while high population growth was an indication that a country was underpopulated. “In examining the principal states of modern Europe,” he wrote, “we shall find that though they have increased very considerably in population since they were nations of shepherds, yet that at present their progress is but slow, and instead of doubling their numbers every twenty-five years they require three or four hundred years, or more, for that purpose, (*First Essay*, p. 89).” Nothing else, in Malthus’s terms, so clearly demonstrated the reality of a population that had reached its limits of subsistence.

Malthus’s only original idea in his population theory, as Marx emphasized, was his arithmetical ratio. But for this he had little or no evidence. He merely espoused it on the basis that it conformed to what, he claimed,

any knowledgeable observer of the state of agriculture would be forced to admit. Indeed, if there was a basis at all for Malthus's arithmetical ratio it could be found in his pre-Darwinian understanding of the natural (as represented in his time by the work of thinkers such as Carolus Linnaeus and William Paley), in which he assumed that there was only limited room for "improvement" in plant and animal species.

Later on, it is true, it became common to see the so-called law of diminishing returns to land of classical economics as the basis for Malthus's arithmetical ratio. But that theory—outside of the work of the gentleman farmer and political economist James Anderson, one of Malthus's most formidable opponents—did not exist even in nascent form before the end of the Napoleonic wars and does not appear except in vague suggestions in any of the six editions of Malthus's *Essay*. It therefore cannot be seen as the foundation for Malthus's argument. As the great conservative economist Joseph Schumpeter remarked, "The 'law' of diminishing returns from land . . . was entirely absent from Malthus's *Essay*."⁷

Malthus's *Essay on Population* also appeared some four decades before the emergence of modern soil science in the work of Justus von Liebig and others. Hence, along with his great contemporary David Ricardo, he saw the fertility of the soil as subject to only very limited improvement. Nor was soil degradation an issue, as Marx, following Liebig, was later to argue. For Malthus, the properties of the soil were not subject to historical change, but were simply "gifts of nature to man" and, as Ricardo said, "indestructible."⁸

The fact that Malthus offered no basis for his arithmetical ratio, as well as the admission that he was forced to make in the course of his argument that there were occasions in which food had increased geometrically to match a geometric rise in population (as in North America)—thereby falsifying his own thesis—did not pass by Malthus's contemporary critics, who were unsparing in their denunciations of his doctrine. In the *Second Essay* (1806 edition) Malthus therefore resorted to sheer bombast in place of argument. As he put it, "It has been said that I have written a quarto volume to prove that population increases in a geometrical, and food in an arithmetical ratio; but this is not quite true. The first of these propositions I considered as proved the moment the American increase was related, and the second proposition as soon as it was enunciated, (*Second Essay*, vol. 2, p. 212)." As one of his contemporary critics responded, "These phrases, if they mean anything, must mean that the geometrical ratio was admitted on very slight proofs, the arithmetical ratio was asserted on no evidence at all."⁹

All of this meant that the *First Essay* was a failure in that the argument was clearly insupportable. The logic of the argument (even if one accepted Malthus's ratios) required that virtuous restraint from marriage either of a temporary or a permanent nature (and not attended by sexual liaisons of another sort) was an impossibility; and that virtuous limits to procreation within marriage were also impossible (Malthus never gave up his opposition to all forms of contraception). Such an argument could not stand in the face of reality, contradicting as it did the marriage pattern of the propertied classes in the England of that day. Hence, Malthus was eventually forced to concede in response to criticisms that some form of moral restraint (especially among the upper classes) was indeed possible—a moral restraint that he was nevertheless to define in extremely restrictive terms as “temporary or final abstinence from marriage on prudential considerations [usually having to do with property], with strict chastity during the single state.” For Malthus, the operation of such narrowly defined moral restraint was “not very powerful.” Still, once this was admitted his whole argument against Godwin and Condorcet lost most of its force.¹⁰

The Second Essay

For this reason Malthus's *Second Essay*, in which he admitted to the possibility of moral restraint, is a very different work from the *First Essay*. Reflecting this the title itself changed to: *An Essay on the Principle of Population; or a View of Its Past and Present Effects on Human Happiness; with an Inquiry into our Prospects Respecting the Future Removal or Mitigation of the Evils which It Occasions*. No more is there any reference in the title to the question of “the future improvement of society” or to Godwin or Condorcet. The main thrust of the work in the *Second Essay* is an attack on the English Poor Laws, a theme which only played a subordinate role in the *First Essay*.

According to the great Malthus scholar Patricia James (editor of the variorum edition of his *Essay on Population*), “it was the 1803 essay [the earliest edition of the *Second Essay*] which made the greatest impression on contemporary thought,” (Introduction to the *Second Essay*, vol. 1, pp. ix–xv). This was because of the severity of the attack on the poor to be found in that work. Although Malthus said in the preface to the *Second Essay* that he had “endeavoured to soften some of the harshest conclusions of the first essay,” this related mainly to his introduction of the possibility of moral restraint (applicable chiefly to the upper classes). In relation to the poor (who, he

believed, were incapable of such moral restraint) his essay was even harsher than before. And it is here, particularly in the 1803 edition, that the most notorious passages are to be found. Thus he wrote that, "With regard to illegitimate children, after the proper notice has been given, they should on no account whatever be allowed to have any claim to parish allowance. . . . The infant is, comparatively speaking, of no value to the society, as others will immediately supply its place," (*Second Essay*, vol. 2, p. 141). In the same callous vein he wrote:

A man who is born into a world already possessed, if he cannot get subsistence from his parents on whom he has a just demand, and if the society do not want his labour, has no claim of *right* to the smallest portion of food, and, in fact, has no business to be where he is. At nature's mighty feast there is no vacant cover for him. She tells him to be gone, and will quickly execute her own orders, if he do not work on the compassion of some of her guests. If these guests get up and make room for him other intruders immediately appear demanding the same favour. . . . The order and harmony of the feast is disturbed, the plenty that before reigned is changed into scarcity. . . . The guests learn too late their error, in counter-acting those strict orders to all intruders, issued by the great mistress of the feast, who, wishing that all her guests should have plenty, and knowing that she could not provide for unlimited numbers, humanely refused to admit fresh comers when her table was already full, (*Second Essay*, pp. 127–8).

This infamous passage, like the one quoted before it, was removed from later editions of the *Essay*. But the basic idea that it reflected—the claim that the poor were not entitled to the smallest portion of relief, and that any attempt to invite them to the "mighty feast" against the will of its "mistress" (who represented natural law) would only come to grief—remained the central ideological thrust of the *Second Essay* throughout its numerous editions. "We cannot, in the nature of things," Malthus wrote, "assist the poor, in any way, without enabling them to rear up to manhood a greater number of their children," (*Second Essay*, vol. 2, p. 192). The essence of the Malthusian doctrine, Marx observed in 1844, was that "charity . . . itself fostered social evils." The very poverty that "formerly was attributed to a deficiency of charity was now ascribed to the *superabundance of charity*."¹¹

One of the harsher implications of Malthus's argument from its inception was that since there were limits to the means of subsistence for maintaining workers in any given period, any attempt to raise wages in general would only result in a rise of prices for this limited stock of provisions—it could not procure for the workers a larger portion of the necessities of life. This erroneous doctrine—which in its more sophisticated versions became

known as the “wages fund doctrine”—was then used to argue that improvement in the general conditions of workers by such means as trade union organization was impossible.

Marx was therefore perfectly justified when he wrote that “what characterises Malthus is the *fundamental meanness* of his outlook.”¹² Moreover, for Marx this meanness had a definite source. Fighting on behalf of the working classes against Malthusianism and its attacks on the poor, William Cobbett leveled the fiery accusation of “*Parson!*” against Malthus in 1819—an accusation of both class domination and narrow-minded moralistic subservience to the doctrine of the established Protestant church. In Cobbett’s own words, “I have, during my life, detested many men; but never anyone so much as you. . . . No assemblage of words can give an appropriate designation of you; and, therefore, as being the single word which best suits the character of such a man, I call you *Parson*, which amongst other meanings, includes that of Borough-monger Tool.”¹³ Marx in *Capital* was later to pick up this criticism, pointing out that discussions of population in Britain had come to be dominated by Protestant parsons or “reverend scribblers,” such as Robert Wallace, Joseph Townsend, Thomas Chalmers, and Malthus himself. It was the recognized task of such “parson naturalists” in the days before Darwin to provide natural law justifications for the established order. Malthus, as Marx observed, was lauded by an English oligarchy frightened by the revolutionary stirrings on the Continent, for his role as “the great destroyer of all hankerings after a progressive development of humanity.”¹⁴

Nowhere perhaps were these narrow, parsonic values more evident than in Malthus’s view of women’s indiscretions. Thus he sought to justify the double standard imposed on women who were “driven from society for an offence [‘A breach of chastity’ outside of marriage, especially if resulting in an illegitimate birth] which men commit nearly with impunity” on the grounds that it was “the most obvious and effectual method of preventing the frequent recurrence of a serious inconvenience to the community,” (*First Essay*, p. 142).

In attacking the English Poor Laws Malthus argued that while limitations in the growth of food impeded the growth of population, society could exist under either low equilibrium, relatively egalitarian conditions, as in China, where population had been “forced” to such an extent that virtually everyone was reduced to near starvation, or it could exist under high-equilibrium conditions, such as pertained in England, where the aristocracy, gentry, and middle class were able to enjoy nature’s “mighty feast”—though only if the

poor were kept away—and where checks short of universal famine (and short of such practices as “exposure of infants”) kept population down. His greatest fear—which he helped to instill in the oligarchy of Britain—was that as a result of excessive population growth combined with egalitarian notions “the middle classes of society would . . . be blended with the poor.”¹⁵

Such Malthusian fears (and the capitalist need to maintain a high rate of exploitation, i.e., the relative impoverishment of the masses) lay behind the eventual passage of the New Poor Law of 1834, which was aimed at ensuring that workers and the poor would look on exploitation in the workplace and even the prospect of slow starvation as in many ways preferable to seeking relief through the Poor Laws.

Malthus responded to the issue of hunger and destitution in Ireland by arguing in a letter to Ricardo in August 1817 that the first object should not be provisions for the relief of the poor but the dispossession of the peasantry: “the *Land* in Ireland is infinitely more populated than in England; and to give full effect to the natural resources of the country, a great part of the population should be swept from the soil into large manufacturing and commercial Towns.”¹⁶

One reason for the hatred that Cobbett and working-class radicals directed against Malthus had to do with the fact that Malthus's influence was so pervasive that it was not simply confined to the middle-class reformers like John Stuart Mill, but even extended into the ranks of working-class thinkers and activists such as Francis Place. For Place, who adopted the Malthusian wages fund theory, birth control became a kind of substitute for class organization—though this was conceived by Place as being not in the interests of capital, but, in his misguided way, in the interests of the working class. The Malthusian ideology thus served from the first to disorganize the working-class opposition to capital.

It was because of this ideological service for the prevailing interests that, as Schumpeter said, “the teaching of Malthus's *Essay* became firmly entrenched in the system of economic orthodoxy of the time in spite of the fact that it should have been, and in a sense was, recognized as fundamentally untenable or worthless by 1803 and that further reasons for so considering it were speedily forthcoming.” With the acknowledgment of moral restraint as a factor Malthus did not so much improve his theory, as Schumpeter further noted, as carry out an “orderly retreat with the artillery lost.”¹⁷

More and more it was recognized that, as Marx stated, “overpopulation is . . . a historically determined relation, in no way determined by abstract

numbers or by the absolute limit of the productivity of the necessities of life, but by the limits posited rather by *specific conditions of production*. . . . How small do the numbers which meant overpopulation for the Athenians appear to us!" For Marx, it was "the historic laws of the movement of population, which are indeed the history of the nature of humanity, the *natural laws*, but natural laws of humanity only at a specific historic development" which were relevant. In contrast, "Malthusian man, abstracted from historically determined man, exists only in his brain."¹⁸ As Paul Burkett has shown, Marx's own political-economic analysis was to point to an inverse relation between workers' wages and living conditions, on the one hand, and population growth, on the other—underscoring the kinds of relations that are now associated with demographic transition theory.¹⁹

Social Darwinism

But while Malthus's doctrine became increasingly insupportable on rational and empirical grounds, it received an added boost in 1859 as a result of the publication of Darwin's *Origin of Species by Means of Natural Selection*. In chapter 3 of his book, entitled "The Struggle for Existence," Darwin wrote,

A struggle for existence inevitably follows from the high rate at which all organic beings tend to increase. Every being which during its natural lifetime produces several eggs or seeds, must suffer destruction during some period of its life, and during some season or occasional year, otherwise, on the principle of geometrical increase, its numbers would quickly become so inordinately great that no country could support the product. Hence, as more individuals are produced than can possibly survive, there must in every case be a struggle for existence, either one individual with another of the same species, or with the individuals of distinct species, or with the physical conditions of life. It is the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms; for in this case there can be no artificial increase of food, and no prudential restraint from marriage.²⁰

Shortly after returning from his memorable five-year voyage on the H.M.S. *Beagle*, Darwin in 1837 had opened his first notebook on what was then called the "transmutation of species." In October 1838, as he later recounted in his *Autobiography*,

I happened to read for amusement Malthus on *Population*, and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable

ones to be destroyed. The result of this would be the formation of new species. Here, then, I had at last got a theory by which to work.²¹

Darwin's claim to have derived inspiration from Malthus's *Essay on Population* in developing the crucial notion of "struggle for existence," which was to underlie his theory of natural selection, was not missed by contemporary social theorists. For Marx it was significant that Darwin had himself (unknowingly) refuted Malthus by means of natural history. Thus in *Theories of Surplus Value* Marx wrote: "In his splendid work *Darwin* did not realise that by discovering the 'geometrical' progression in the animal and plant kingdom, he *overthrew* Malthus's theory. Malthus's theory is based on the fact he set 'Wallace's geometrical progression of man against the chimerical 'arithmetical' progression of animals and plants."²² A year later Marx wrote in a letter to Engels:

As regards Darwin, whom I have looked at again, it amuses me that he says he applies the "Malthusian" theory *also* to plants and animals, as if Malthus's whole point did not consist in the fact that his theory is applied not to plants and animals but only to human beings—in geometrical progression—as opposed to plants and animals. It is remarkable that Darwin recognises among brutes and plants his English society with its division of labour, competition, opening up of new markets, "inventions" and Malthusian "struggle for existence." It is Hobbes's *bellum omnium contra omnes*.²³

Marx himself did not dispute the general accuracy of Darwin's theory of natural selection, but clearly relished the irony of Darwin's discovery of bourgeois society "among brutes and plants." What was illegitimate from a Marxist standpoint was the attempt, as Engels wrote in the *Dialectics of Nature*, "to transfer these theories back again from natural history to the history of society . . . as eternal natural laws of society."²⁴

This, however, is exactly what happened with the advent of the broad group of eclectic "theories" that we commonly classify as "social Darwinist"—but which had little in fact to do with Darwinism. These theories drew directly on Malthus, Harriet Martineau, Herbert Spencer, and various nineteenth-century racist thinkers (whose views were anathema to Darwinism properly understood). In the United States the leading academic social Darwinist was William Graham Sumner who argued that "The millionaires are a product of natural selection."²⁵ This was simply Malthus, refurbished with the help of the Darwinian-Spencerian lexicon, and used to justify race and class inequality. Needless to say, this view was extremely attractive to the likes of such robber barons as John D. Rockefeller, James J.

Hill, and Andrew Carnegie. Rockefeller told a Sunday school class that “the growth of a large business is merely a survival of the fittest . . . merely the working out of a law of nature and a law of God.”²⁶ Internationally social Darwinism was used to justify the imperialist policy of mass violence and annihilation succinctly summed by Kurtz in Joseph Conrad’s *Heart of Darkness*—“exterminate all the brutes.”²⁷

This general type of outlook is still prevalent within mainstream ideology, evident in the work of such influential establishment figures as sociologist Charles Murray, author of the influential Reaganite tract *Losing Ground* (a Malthusian-style attack on the welfare state), and coauthor (together with Richard Herrnstein) of the no less influential work *The Bell Curve* (a pseudo-scientific, racist attempt to resurrect the old idea of a racial hierarchy in mental capacity—in order to attack affirmative action programs). What Marx called the “fundamental meanness” of Malthus’s doctrine has thus been carried forward into the present, and given a more racial overtone.

Neo-Malthusianism

But it is in the wider realm of ecological theory—linked to a strategy of international domination—that Malthus has his greatest and most direct impact today. In the late 1940s Malthus’s long-dormant population theory was resurrected as part of new hegemonic ideology of imperial control—central to both the Cold War and the Green Revolution. A key role here was played by the wealthy Osborn family in the United States. Henry Fairfield Osborn of the American Museum of Natural History was one of the leading proponents of scientific racism and eugenics in the United States in the early part of the century. His nephew, financier Frederick Osborn, subsidized the International Congress on Eugenics (when his uncle was president), and was a key figure in the development of modern demographic policy, in conjunction with his wealthy colleagues in the Rockefeller Foundation and Milibank Fund. By the late 1940s open advocacy of racist views and eugenics lost much of its respectability as a result of the Holocaust. Nevertheless the general outlook persisted in more circumspect form, and was given renewed respectability by the likes of Henry Fairfield Osborn’s son, Henry Fairfield Osborn, Jr., who wrote under the name of Fairfield Osborn, and who authored the best-selling ecological study *Our Plundered Planet* (1948). Fairfield Osborn rejected the explicit scientific racism of his father, turning instead directly to Malthus (with his more innocuous

attacks on the poor overpopulating masses). “Shades of Dr. Malthus! He was not so far wrong,” Osborn wrote in neo-Malthusian rather than classical Malthusian terms, “when he postulated that the increase in population tends to exceed the ability of the earth to support it.” Fairfield Osborn’s close associate, William Vogt, head of the Conservation Section of the Pan American Union, and author of the neo-Malthusian tract *The Road to Survival* (1948), was more explicit. Vogt argued that “one of the greatest national assets of Chile, perhaps the greatest asset, is its high death rate.” And in an infamous passage entitled “The Dangerous Doctor” he declared:

The modern medical profession, still framing its ethics on the dubious statements of an ignorant man [Hippocrates] who lived more than two thousand years ago . . . continues to believe it has a duty to keep alive as many people as possible. In many parts of the world doctors apply their intelligence to one aspect of man’s welfare—survival—and deny their moral right to apply it to the problem as a whole. Through medical care and improved sanitation they are responsible for more millions living more years in increasing misery. Their refusal to consider their responsibility in these matters does not seem to them to compromise their intellectual integrity. . . . They set the stage for disaster; then, like Pilate, they wash their hands of the consequences.²⁸

Through the Rockefeller Foundation and later the Ford Foundation, as Eric Ross has explained, neo-Malthusianism was integrated into U.S. policy, first in response to the Chinese revolution, and then as part of a more deliberate policy of counterrevolution in the countryside (a new period of primitive accumulation) under the rubric of the Green revolution.²⁹ In 1948, Princeton’s neo-Malthusian ideologue Frank Notestein, who had been patronized by Frederick Osborn, was sent to China (where the Rockefeller family had extensive business interests) on behalf of the Rockefeller Foundation. He reported back that overpopulation was the chief reason for the revolution, which could be combated more effectively through contraception than land reform. It was quickly recognized, however, that a more drastic approach was needed. And during the years that Robert McNamara was president of the World Bank, the Rockefeller Foundation and the Ford Foundation launched the Green Revolution, the commercialization of land in the Third World using the model of U.S. agribusiness—a ruthless form of “land reform” (i.e., land expropriation) that was legitimated by reference to Malthusian population tendencies.

By the late 1960s, with the development of the ecological movement, this emphasis on overpopulation came to be the main explanation for not only hunger in the Third World, but all ecological problems (in a manner

prefigured by Osborn and Vogt). Paul Ehrlich, the author of the best-selling *Population Bomb* (1968), was to credit Vogt as the initial source for his interest in the population issue.³⁰ The eugenicist Garrett Hardin, who became renowned within contemporary environmentalism for his article “The Tragedy of the Commons” and for his advocacy of “Lifeboat Ethics,” penned a piece “To Malthus” in 1969 in which he wrote,

Malthus! Thou shouldst be living in this hour:
The world hath need for thee: getting and begetting,
We soil fair Nature's bounty³¹

This resurrection of Malthus as an ecologist was an attempt to give ecology a conservative, pro-capitalist rather than revolutionary character, and required that Malthus's actual argument be ignored. This was the same Malthus who had made a point of emphasizing that his argument did not have to do with the eventual overstocking of the earth with inhabitants but rather with the *constant* pressure of population on food supply (true throughout history); who had avoided the term “overpopulation,” which made no sense within his strict equilibrium model; who was adamantly opposed to the use of contraceptives; who was the principal advocate within classical economics of the idea that the earth or soil was a “gift of nature to man”; who in contrast to James Anderson in his own day had made no mention of the degradation of the soil; who subscribed to the view (enunciated by David Ricardo) that the powers of the soil were “indestructible”; and who said that the peasantry should be “swept from the soil.” In spite (or in ignorance) of all of this Malthus was gradually converted, in neo-Malthusian thought, into an “ecological” thinker—the fountainhead of all wisdom in relation to the earth.

Malthus, we are frequently told, emphasized the scarcity of resources on earth and the limitations of human carrying capacity throughout his argument. Yet this flies in the face of the arguments of the real Malthus who wrote in his *Essay on Population* that “raw materials” in contrast to food “are in great plenty” and “a demand . . . will not fail to create them in as great a quantity as they are wanted,” (Malthus, *First Essay*, p. 100). Malthus, in contrast to Marx, had failed to take note of Lucretius's materialist maxim “*nil posse creari de nihilo*,” out of nothing, nothing can be created.³² Nor did Malthus escape the pre-Darwinian notion that the capacity of organic life to change and “improve” was extremely limited. As Loren Eiseley observed: “It is perhaps worth noting, since the biological observations

of Malthus are little commented upon, that he recognized like so many others, the effects of selective breeding in altering the appearance of plants and animals, but regarded such alterations of form as occurring within admittedly ill-defined limits.”³³

There can be little doubt that the real aim of this neo-Malthusian resurrection of Malthus, then, was to resurrect what was after all the chief thrust of the Malthusian ideology from the outset: that all of the crucial problems of bourgeois society and indeed of the world could be traced to overprocreation on the part of the poor, and that attempts to aid the poor directly would, given their innate tendency to vice and misery, only make things worse. As Hardin put it in his essay “Lifeboat Ethics: The Case Against Helping the Poor,” any attempt to open up international granaries to the world population or to relax immigration restrictions in the rich countries would only create a situation where “The less provident and less able will multiply at the expense of the abler and more provident, bringing eventual ruin upon all who share in the commons.”³⁴ Charity for the poor would not help the poor, he argued, but would only hurt the rich.

For neo-Malthusians of this sort, like Malthus before them, the future improvement of society was therefore impossible, except in the form of the accumulation of wealth among the well-to-do. Malthus—himself an eighteenth-century Parson—would have fully understood the Vicar of Wakefield’s observation that “the very laws of a country may contribute to the accumulation of wealth; as when those natural ties that bind the rich and poor together are divided.” But he would have disagreed with the Vicar’s (i.e., Goldsmith’s) anti-acquisitive and paternalistic philosophy, believing instead that the rich and the poor are naturally opposed, and that the rich ought to concern themselves simply with their own aggrandizement. Over the last 200 years Malthusianism has thus always served the interests of those who represented the most barbaric tendencies within bourgeois society.

All of this is not to deny that there are radical, even revolutionary, ecologists who have drawn inspiration from Malthus (though in this respect they are well deceived). Nor is it to deny that population growth is one of the most serious problems of the contemporary age. But demographic change cannot be treated in natural law terms but only in relation to changing historical conditions. The demographic transition theory, which emphasizes the way in which the rate of population growth decreases with increases in economic and social well-being, is therefore a more reliable guide to these issues than Malthusianism. Even famine cannot be explained in terms of a shortage of

food in relation to population, as Amartya Sen has definitively demonstrated, but in each and every case arises as a result of differential “entitlement” emanating from the nature of the capitalist market economy. Where threats to the integrity of the biosphere as we know it are concerned, it is well to remember that it is not the areas of the world that have the highest rate of population growth but the areas of the world that have the highest accumulation of capital, and where economic and ecological waste has become a way of life, that constitute the greatest danger.

The Necessity of Malthus

As Marx wrote, “The hatred of the English working class for Malthus—‘the mountebank-parson,’ as Cobbett *rudely* called him . . .—was thus fully justified and the people’s instinct was correct here, in that they felt that he was no *man of science*, but a *bought advocate* of their opponents, a shameless sycophant of the ruling classes.”³⁵ Although Marx has been criticized for the intemperance of his remarks with respect to Malthus, a close examination of both Malthus’s ideas and the subsequent development of Malthusianism in both its social Darwinist and neo-Malthusian phases can hardly produce any other conclusion. (It is no doubt for this reason that supporters of Malthus rarely examine his ideas closely—at least in public.) Malthus represents the class morality (and the race and gender morality) of the capitalist system and in this sense Malthusianism is a historic necessity of capitalism. To censure Malthus, then, is not enough; it is also necessary to censure the system that brought him into being and that through its own actions perpetuates his memory.

1. Ted Benton, “Marxism and Natural Limits,” *New Left Review*, no. 178 (November–December 1989), pp. 58–9, 82. In referring to Malthus as an “epistemic conservative” Benton accepts at his word Malthus’s early rhetorical claim that he found the utopian visions of society offered by Condorcet and Godwin attractive, but was forced to reject them as incompatible with the human condition on earth (a rhetorical device common in Malthus’s time). Given the nature of Malthus’s class alliances and the character of his work as a whole it is clear that Malthus was being disingenuous here. He was an early ideologue of capitalism, not a disappointed representative of revolutionary Enlightenment thinking. For a critique of Benton see Paul Burkett, “A Critique of New-Malthusian Marxism: Society, Nature, and Population,” *Historical Materialism*, no. 2 (Summer 1998), pp. 118–42. For a reply to the charge of Prometheanism see John Bellamy Foster, “Marx and the Environment,” in Ellen Meiksins Wood and John Bellamy Foster, eds., *In Defense of History* (New York: Monthly Review Press, 1997), pp. 149–62.

2. Friedrich Engels, "Outline of a Critique of Political Economy," in Karl Marx, *The Economic and Philosophic Manuscripts of 1844* (New York: International Publishers, 1964), pp. 212, 221.
3. Page references to the *First Essay* in what follows will be Thomas Malthus, *An Essay on the Principle of Population and a Summary View of the Principle of Population* (Harmondsworth: Penguin, 1970). Page references to the *Second Essay* will be to the variorum edition: Thomas Robert Malthus, *An Essay on the Principle of Population; or a View of its Past and Present Effects on Human Happiness; With an Inquiry into Our Prospects Respecting the Removal or Mitigation of the Evils Which it Occasions* (Cambridge: Cambridge University Press, 1989), 2 volumes.
4. Robert Wallace, *Various Prospects of Mankind, Nature, and Providence* (London: A. Millar, 1761), pp. 107, 114–7, 125.
5. William Godwin, *Enquiry Concerning Political Justice and its Influence on Morals and Happiness* (Toronto: University of Toronto Press, 1946), vol. 2, pp. 515–8.
6. Malthus was very consistent in avoiding references to the overpopulation of the earth in the modern sense, even correcting those few passages in his work where he had inadvertently left the impression that human population had surpassed the means of subsistence, changing this to "easy means of subsistence." See Edwin Cannan, *A History of Theories of Production and Distribution in English Political Economy from 1776 to 1848* (New York: Augustus M. Kelley, 1917), p. 108.
7. Joseph Schumpeter, *A History of Economic Analysis* (New York: Oxford, 1954), p. 581.
8. Thomas Robert Malthus, *Pamphlets* (New York: Augustus M. Kelley, 1970), p. 185; David Ricardo, *Principles of Political Economy and Taxation* (Cambridge: Cambridge University Press, 1951), p. 67.
9. Piercy Ravenstone, quoted in Kenneth Smith, *The Malthusian Controversy* (London: Routledge and Kegan Paul, 1951), p. 224.
10. Thomas Robert Malthus, *Occasional Papers* (New York: Burt and Franklin, 1963), p. 139.
11. Karl Marx, *Early Writings* (New York: Vintage, 1974), pp. 408–9.
12. Karl Marx, *Theories of Surplus Value*, Part II (Moscow: Progress Publishers, 1968), p. 117. Translation according to Karl Marx and Friedrich Engels, *Malthus*, edited by Ronald L. Meek (New York: International Publishers, 1954), pp. 118–19.
13. Cobbett, quoted in Smith, *The Malthusian Controversy*, p. 120.
14. Karl Marx, *Capital*, vol. 1 (New York: Vintage, 1976), p. 766.
15. Malthus, *Pamphlets* (New York: Augustus M. Kelley, 1917), p. 18.
16. Malthus to Ricardo, August 17, 1817, in David Ricardo, *Works and Correspondence* (Cambridge: Cambridge University Press, 1952) vol. 7, p. 175.
17. Schumpeter, *A History of Economic Analysis* (New York: Oxford, 1954), pp. 548, 580.
18. Marx, *Grundrisse*, (New York: Vintage, 1973), p. 606.
19. Paul Burkett, "A Critique of Neo-Malthusian Marxism," *Historical Materialism*, no. 2 (summer 1998), pp. 129–30.
20. Charles Darwin, *The Origin of Species by Means of Natural Selection* (Harmondsworth: Penguin, 1968), p. 117.
21. Charles Darwin, *Autobiography* (New York: Harcourt Brace, 1958), p. 120.
22. Karl Marx, *Theories of Surplus Value*, Part II, p. 121.

23. Marx to Engels, June 18, 1862. As quoted in Marx and Engels, *Malthus*, p. 173.
24. Friedrich Engels, *Dialectics of Nature* (New York: International Publishers, 1940), pp. 208-09.
25. Sumner quoted in Richard Hofstadter, *Social Darwinism in American Thought* (Boston: Beacon Press, 1955), p. 58.
26. Rockefeller quoted in Alan Chase, *The Legacy of Malthus* (New York: Alfred A. Knopf, 1977), p. 8.
27. See Sven Lindqvist, *Exterminate All the Brutes* (New York: The New Press, 1996).
28. Fairfield Osborn and Vogt quoted in Chase, *The Legacy of Malthus*, pp. 376-79.
29. Eric B. Ross, "Malthusianism, Counter-revolution and the Green Revolution," *Organization & Environment*, 12: 1 (December 1998), pp. 446-50.
30. Chase, *The Legacy of Malthus*, pp. 381-82.
31. Garrett Hardin, "To Malthus," in Hardin ed., *Population, Evolution and Birth Control* (San Francisco: W.H. Freeman, 1969), p. 88.
32. Lucretius quoted in Marx, *Capital*, vol. 1, p. 323.
33. Loren Eiseley, *Darwin's Century* (New York: Anchor Books, 1958), p. 332.
34. Garrett Hardin, "Lifeboat Ethics," *Psychology Today* (September 1974), p. 124.
35. Marx, *Theories of Surplus Value*, Part II, p. 120.

12 — Liebig, Marx, and the Depletion of Soil Fertility

RELEVANCE FOR TODAY'S AGRICULTURE *

During the period 1830-1870, the depletion of the natural fertility of the soil through the loss of soil nutrients was the central ecological concern of capitalist society in both Europe and North America (only comparable to concerns over the loss of forests, the growing pollution of the cities, and the Malthusian specter of overpopulation). This period saw the growth of guano imperialism as nations scoured the globe for natural fertilizers; the emergence of modern soil science; the gradual introduction of synthetic fertilizers; and the formation of radical proposals for the development of a sustainable agriculture, aimed ultimately at the elimination of the antagonism between town and country.

The central figure in this crisis of soil fertility was the German chemist Justus von Liebig. But the most penetrating analysis of its wider social implications was made by Karl Marx. The views of Liebig and Marx on soil fertility were to be taken up by later thinkers, including Karl Kautsky and V. I. Lenin within the Marxist tradition. Still, by the mid-twentieth century the problem seemed to have abated due to the development of a massive fertilizer industry and the intensive application of synthetic fertilizers.

Today, a growing understanding of the ecological damage inflicted by the reliance on synthetic chemical inputs, the scale of which vastly increased following the Second World War, has generated new interest in a sustainable agriculture in which soil nutrient cycling plays a central role. The need to devise an ecologically sound relationship of people to the soil is being rediscovered.¹ What follows is a brief outline of the evolution of this issue over the last one hundred fifty years.

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Liebig and the Nineteenth Century Crisis of the Soil

In the 1820s and 1830s in Britain, and shortly afterwards in the other developing capitalist economies of Europe and North America, concern over the “worn-out soil” led to a phenomenal increase in the demand for fertilizer. The value of bone imports to Britain increased from £14,400 in 1823 to £254,600 in 1837. The first boat carrying Peruvian guano (the accumulated dung of sea birds) arrived in Liverpool in 1835; by 1841 1,700 tons were imported, and by 1847 some 220,000 tons arrived. So desperate were European farmers in this period that they raided the Napoleonic battlefields (Waterloo, Austerlitz) for bones to spread over their fields.²

The rise of modern soil science was closely correlated with this demand for increased soil fertility to support capitalist agriculture. In 1837 the British Association for the Advancement of Science solicited a work on the relationship between agriculture and chemistry from Liebig. The result was his *Organic Chemistry in its Applications to Agriculture and Physiology* (1840), which provided the first convincing explanation of the role of soil nutrients, such as nitrogen, phosphorous, and potassium, in the growth of plants. In England Liebig’s ideas influenced the wealthy landowner and agronomist J. B. Lawes, who had begun experiments on fertilizers on his property in Rothamsted, outside London, in 1837. In 1842 Lawes introduced the first artificial fertilizer, after inventing a means of making phosphate soluble, and in 1843 he built a factory for the production of his new “superphosphates.”

Nevertheless, this technology was slow to diffuse outside of Britain. The first factories for the production of superphosphates were introduced in Germany only in 1855; in the United States only after the Civil War; and in France only after the Franco-Prussian War. Moreover, the results obtained from the application of a single nutrient (such as phosphate) to the soil, although initially producing dramatic results, tended to diminish rapidly after that, since overall soil fertility is always limited by the nutrient in least abundance (Liebig’s Law of the Minimum).

Hence, Liebig’s discoveries at first only intensified the sense of crisis within capitalist agriculture, making farmers more aware of the depletion of soil minerals and the paucity of fertilizers. This contradiction was experienced with particular acuity in the United States—especially among farmers in upstate New York and in the southeastern plantation economy.

Blocked from easy economical access to guano (which was high in both nitrogen and phosphates) by the British monopoly on Peruvian guano supplies, the United States undertook—first unofficially and then as part of a deliberate state policy—the imperial annexation of any islands thought to be rich in this natural fertilizer. Under the authority of what became the Guano Island Act, passed by Congress in 1856, U.S. capitalists seized 94 islands, rocks, and keys around the globe between 1856 and 1903, 66 of which were officially recognized by the Department of State as U.S. appurtenances. Nine of these guano islands remain U.S. possessions today. Yet guano imperialism was unsuccessful in providing the United States with the quantity and quality of natural fertilizer it needed.³

Meanwhile, Peruvian guano supplies had begun to run out in the 1860s and had to be replaced by Chilean nitrates. Although the potassium salts discovered in Europe gave ready access to that mineral, and both natural and artificial supplies of phosphates made that nutrient more available, the limiting factor continued to be fertilizer nitrogen (a synthetic nitrogen fertilizer was not developed until 1913).

The decline in natural soil fertility due to the disruption of the soil nutrient cycle accompanying capitalist agriculture, the growing knowledge of the need for specific soil nutrients, and limitations in the supply of both natural and synthetic fertilizers that would compensate for the loss of natural fertility, all contributed, therefore, to a widespread sense of a crisis in soil fertility.

In the United States this was further complicated by geographical factors. In upstate New York, which by 1800 had displaced New England as a center for wheat cultivation, the relative exhaustion of the soil was brought into sharp relief by steadily increasing competition from new farmlands to the West in the decades following the opening of the Erie Canal in 1825. Meanwhile the slave plantations of the southeast experienced dramatic declines in fertility, particularly on lands devoted to the production of tobacco.

In New York farmers responded to the crisis by promoting a more rational agriculture through the creation of agricultural societies. In 1832 the New York Agricultural Society was formed. Two years later Jesse Buel, an Albany newspaper editor, started the *Cultivator*, which sought to promote the kind of improved farming already being introduced in Britain, concentrating on issues such as manures, draining wet soils, and crop rotation. With the publication in 1840 of Liebig's *Agricultural Chemistry* (as his *Organic Chemistry in its Applications to Agriculture and Physiology* is

commonly known), New York agriculturists turned to the new soil science as a savior. In 1850 the Scottish agricultural chemist Professor James F. W. Johnston, whom Marx was to call “the English Liebig,” traveled to North America, and in his influential work *Notes on North America* documented the loss of natural soil fertility, demonstrating in particular the depleted condition of the soil in New York as compared to the more fertile farmlands to the West.⁴

Many of these issues were reflected in the work of U.S. economist Henry Carey, who throughout the 1850s laid stress on the fact that long-distance trade arising from the separation of town and country was a major factor in the net loss of soil nutrients and the growing crisis in agriculture—a point later developed further by Liebig and Marx. “[A]s the whole energies of the country,” Carey wrote of the United States in his *Principles of Social Science* (1858), “are given to the enlargement of the trader’s power, it is no matter of surprise that its people are everywhere seen employed in ‘robbing the earth of its capital stock.’”⁵

These concerns of North American agriculturists were transmitted in turn to Liebig, mainly through the work of Carey. In his *Letters on Modern Agriculture* (1859), Liebig argued that the “empirical agriculture” of the trader gave rise to a “spoliation system” in which the “conditions of the reproduction” of the soil were violated. Soil nutrients were “carried away in produce year after year, rotation after rotation.” Both the open system of exploitation of American farming and the so-called high farming of European agriculture were thus forms of “robbery.” “Rational agriculture,” in contrast, would give “back to the fields the conditions of their fertility.”⁶

Liebig looked forward to an eventual increase in the availability of fertilizers, both through discoveries of natural sources and the production of synthetic fertilizers. Yet he nonetheless generated what soil science historian Jean Boulaïne has called a “great campaign to economize fertilizer use and to recycle nutritive elements on European farms.” In this sense he was a “precursor of today’s ecologists.”⁷ In his *Letters on the Subject of the Utilization of the Municipal Sewage Addressed to the Lord Mayor of London* (1865) Liebig argued—based on the condition of the Thames—that the two problems of the pollution of the cities with human and animal excrement and the depletion of the natural fertility of the soil were connected, and that organic recycling that would return nutrients to the soil was an indispensable part of a rational urban-agricultural system.⁸

Marx and Sustainable Agriculture

Marx relied heavily on the works of Liebig, Johnston, and Carey in his critique of capitalist agriculture. However, the root source for Marx's critique in this area was James Anderson, a Scottish agronomist, practicing farmer, and political economist who was a contemporary of Adam Smith.

In 1777 Anderson published *An Enquiry into the Nature of the Corn Laws* in which he introduced what was to become known as the Malthusian/Ricardian theory of rent. In Marx's view, Anderson's original model was far superior to the variant later offered by the classical economists Thomas Malthus and David Ricardo since it placed strong emphasis on the possibility of continuing agricultural improvement. Rent, Anderson argued, was a charge for the use of the more fertile soil. The least fertile soils in cultivation generated an income that simply covered the costs of production, while the more fertile soils received a "certain premium for an exclusive privilege to cultivate them; which will be greater or smaller according to the more or less fertility of the soil. It is this premium which constitutes what we now call rent; a medium by means of which the expence of cultivating soils of very different degrees of fertility may be reduced to a perfect equality."⁹

For Malthus and Ricardo the source of this differential fertility came to be seen almost entirely in terms of conditions of natural productivity independent of human beings. As Ricardo wrote, rent could be defined as "that portion of the produce of the earth, which is paid to the landlord for the use of the original and indestructible powers of the soil."¹⁰ Moreover, they argued—with the presumed backing of natural law—that lands that were naturally the most fertile were the first to be brought into production, and that rising rent on these lands and diminishing agricultural productivity overall were the result of bringing lands of more and more marginal fertility into cultivation, in response to increasing population pressures.¹¹

In contrast Anderson had earlier insisted that continual improvement of the soil, through manuring, draining, and irrigating, was possible and that the productivity of the least fertile land could rise to a point that brought it much closer to that of the most fertile land; but also that the converse was true, and human beings could degrade the soil. It was such changes in relative productivity of the soil, according to Anderson, that accounted for differential rent—and not conditions of absolute fertility, as in the later arguments of Malthus and Ricardo.¹²

Where general fertility problems did arise in agriculture, this was, for Anderson, a consequence of the failure to adopt rational and sustainable

agricultural practices. The fact that the land in England was owned by landed proprietors and farmed by capitalist tenant farmers, he argued, posed obstacles to rational agriculture, since the farmer tended to avoid all improvements, the full return for which would not be received for the duration of the lease.¹³

In *A Calm Investigation of the Circumstances that Have Led to the Present Scarcity of Grain in Britain* (1801), Anderson contended that the division between town and country had led to the loss of natural sources of fertilizer. "Every person who has but heard of agriculture," he wrote, "knows that animal manure, when applied to the soil tends to add to its fertility; of course he must be sensible that every circumstance that tends to deprive the soil of that manure ought to be accounted an uneconomical waste highly deserving of blame." It was possible, he asserted, by the judicious application of animal and human wastes to sustain the "soil for ever after, without the addition of any extraneous manures." Yet London, with its gargantuan waste of such natural sources of fertility, "which is daily carried to the Thames, in its passage to which it subjects the people in the lower part of the city to the most offensive effluvia," was an indication of how far society had moved from a sustainable agricultural economy.¹⁴ Armed with this critical analysis, and a historical perspective, Anderson strenuously attacked the Malthusian view that the crisis of agriculture and society could be traced to rising human population and its pressures on a limited supply of land.¹⁵

Marx's critique of capitalist agriculture drew upon both Anderson's original formulation of the classical rent theory and Liebig's soil chemistry in order to combat the influence of the Malthusian/Ricardian natural law doctrines of overpopulation and diminishing agricultural productivity. In the 1840s and 1850s Marx stressed the potential for "improvement" in agriculture if rationally organized through such means as the application of synthetic fertilizers.¹⁶ Even in these early decades, however, he insisted that soil fertility was a historical issue, and that fertility could both improve and decline. The irrationality of capitalist agriculture, he argued, was bound up with the whole antagonism of town and country out of which bourgeois society had arisen.

But by the 1860s, based on his reading of such thinkers as Liebig, Johnston, and Carey, and in response to the soil fertility crisis, Marx began to focus directly on the soil nutrient cycle and its relation to the exploitative character of capitalist agriculture. Thus, in the first volume of *Capital* he wrote:

Capitalist production . . . disturbs the metabolic interaction between man and the earth, i.e. it prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; hence it hinders the operation of the eternal natural condition for the fertility of the soil. . . . All progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil; all progress in increasing the fertility of the soil for a given time is a progress towards ruining the more long-lasting sources of that fertility. . . . Capitalist production, therefore, only develops the techniques and degree of combination of the social process of production by simultaneously undermining the original sources of all wealth—the soil and the worker.¹⁷

This argument was developed systematically in Marx's analysis of capitalist ground rent in the third volume of *Capital*, where Marx also observed that "In London . . . they can do nothing better with the excrement produced by 4.5 million people than pollute the Thames with it, at monstrous expense."¹⁸ Such considerations on capitalist agriculture and the recycling of organic wastes led Marx to a concept of ecological sustainability—a notion that he thought of very limited practical relevance to capitalist society, but vital for a society of associated producers.¹⁹ The "conscious and rational treatment of the land as permanent communal property," he wrote, is "the inalienable condition for the existence and reproduction of the chain of human generations."²⁰ Further:

From the standpoint of a higher socio-economic formation, the private property of particular individuals in the earth will appear just as absurd as the private property of one man in other men. Even an entire society, a nation, or all simultaneously existing societies taken together, are not owners of the earth, they are simply its possessors, its beneficiaries, and have to bequeath it in an improved state to succeeding generations, as *boni patres familias* [good heads of the household].²¹

Subsequent thinkers in the Marxist tradition, such as Kautsky and Lenin, were to be deeply affected by the arguments of Liebig and Marx on agricultural sustainability and the necessity of recycling organic wastes, and argued for the return of nutrients to the soil as a necessary part of a revolutionary transformation of society—despite the increased availability of fertilizers in their time. In *The Agrarian Question* (1899), Kautsky insisted that

Supplementary fertilisers . . . allow the reduction in soil fertility to be avoided, but the necessity of using them in larger and larger amounts simply adds a further burden to agriculture—not one unavoidably imposed on nature, but a direct result of current social organization. By overcoming the antithesis between town and country, or at least between the densely populated cities and the desolated open country, the materials removed from the soil would be able to flow back in full. Supplementary fertilisers would then, at most, have the task of enriching the soil, not staving off its impoverishment.

Advances in cultivation would signify an increase in the amount of soluble nutrients in the soil without the need to add artificial fertilisers.²²

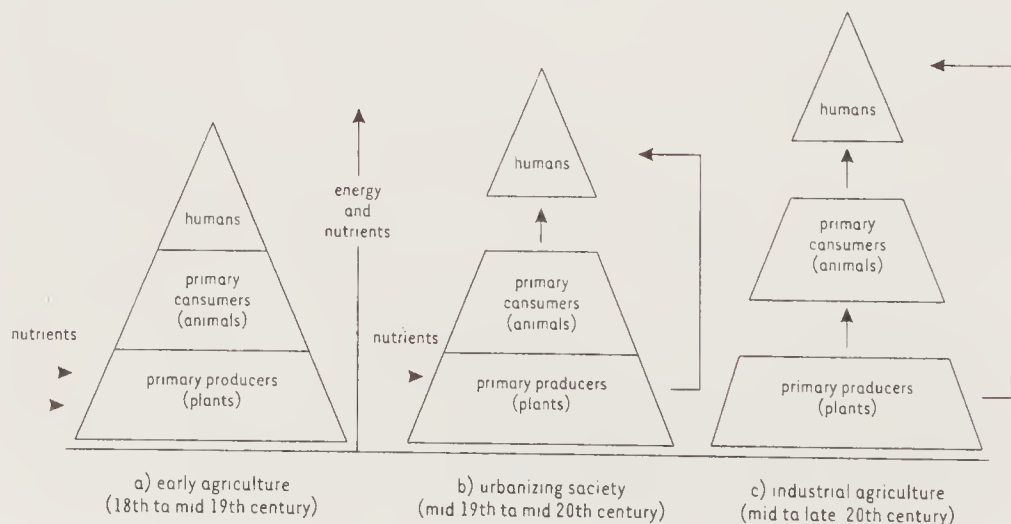
Similarly, Lenin observed in *The Agrarian Question and the "Critics of Marx"* (1901) that,

The possibility of substituting artificial for natural manures and the fact that this is already being done (partly) do not in the least refute the irrationality of wasting natural fertilisers and thereby polluting the rivers and the air in suburban and factory districts. Even at the present time there are sewage farms in the vicinity of large cities which utilise city refuse with enormous benefit to agriculture; but by this system only an infinitesimal part of the refuse is utilized.²³

Relevance for Today

The trends that were of concern to Anderson, Liebig, Marx, Kautsky, and Lenin only intensified as capitalism developed in the twentieth century. As mechanization and low prices for farm products forced people off the farms, workers concentrated first in cities and then in suburban communities. The continued development of employment opportunities in the urban industrial sector and then in the urban-suburban service and government sectors later in the century provided job outlets for the former farm families. (On the other hand, urbanization in most Third World countries has taken place without commensurate increases in employment in the cities.) As an ever higher percentage of the population lived off the farm, the break in the cycling of nutrients was even more complete than in the

FIGURE 1—Changes in the Spatial Relationships of Plants, Animals, and Humans



nineteenth century. This break in the return flow of nutrients to the land is illustrated in Figure 1.

As soils became depleted of nutrients and organic matter they became less fertile and there was much concern about what to do with “worn-out” soils. At the same time that nutrients were depleted from farmland, sewage containing those nutrients fouled many lakes and rivers, while coastal cities dumped sewage into the ocean. Although sewage treatment systems installed since the 1970s have decreased the problem of water pollution in the United States, a new problem was created—how to get rid of the sludge that is produced. Currently sewage sludge is buried in landfills, incinerated, or applied to farmland, each of which has significant environmental consequences.

Two developments set the stage for a second break in the cycling of nutrients. First, the availability of inexpensive nitrogen fertilizers following the Second World War helped put in motion a number of changes. The production of nitrogen fertilizers uses the same process as the production of explosives, and the end of war production freed up a large capacity to make nitrogen fertilizers. (It is also important to note a further agrichemical connection to the military-industrial complex: many of the pesticides used in agriculture were originally developed for military purposes as defoliants and nerve agents.) With the widespread availability of nitrogen fertilizers, there was no longer a need to rely on legume crops, which convert atmospheric nitrogen into a form that plants can use, to supply non-legumes with sufficient fertility. The legume clover and alfalfa hay crops had previously been fed to ruminant animals such as beef and dairy cows and sheep. Once there was no need to grow those crops to supply nitrogen for non-legume crops (wheat, corn, barley, tomatoes), farms could more easily specialize as either crop or livestock operations.

Second, as concentration accelerated in agricultural production, processing, and marketing, corporations began to encourage production of animals near the few large processing facilities that they operated. They selected locations that offered certain advantages such as lax environmental laws, negligible threat of union activity, and low wages. The large processors were also increasingly marketing their products under brand names and, to have a uniform and predictable product, needed to control as much of the entire process as possible—either by producing the animals on their own corporate farms or under production contracts where the farmer might not even own the animals and had to follow strict instructions from their corporate employer.

Thus animal production became concentrated in certain regions: beef feedlots in the southern Great Plains, poultry in Arkansas and on the Delmarva peninsula (composed of parts of Delaware, Maryland, and Virginia), and hog production in certain parts of the Midwest and in North Carolina.

These two developments in the second half of the twentieth century have led to a new phenomenon that mirrors the separation of people from the farmland that so concerned Marx and others—the separation of agricultural animals from the cropland that produces their feeds (Figure 1c). The large-scale U.S. poultry and hog megafarms (aptly called factory farms) are owned almost exclusively by corporate integrators or by individual farmers under production contracts for corporations such as Tyson and Perdue. And beef feedlots with tens of thousands of animals are not uncommon. More than a third of cattle marketed in the United States come from just seventy feedlots, while 97 percent of U.S. poultry sales are controlled by operations that generate in excess of 100,000 broilers per year.²⁴ Even on dairy farms that produce a lot of their own feed, it is common to import about half of the animals' needs. This breakdown of the physical connection between the animals and the land producing their feeds has worsened the depletion of nutrients and organic matter from soils producing crops. Crop farms must use large amounts of synthetic fertilizers to compensate for the loss of vast quantities of nutrients as their products are sold.

In addition, as pointed out by Anderson and Marx, those renting land to produce crops have no economic incentive to make improvements for which they will not receive compensation during the life of the rental agreement. Fully 48 percent of all U.S. agricultural land in 1994 was rented from others.²⁵ In some sectors rental is especially common, with 60 percent of the cash grain land and 75 percent of all cotton land.²⁶ Land rental is also more common on larger farms, with 58 percent of the land operated by farms with annual gross receipts of \$250,000 or more under rental agreements.²⁷ The great extent of rented land is another factor that increases the trend toward farm specialization and short-term approaches to maintaining soil fertility that rely on synthetic fertilizers rather than environmentally sound, long-term soil and crop management strategies.

Environmental Consequences

The lack of nutrient cycling resulting from the physical separation first of people and then of animals from cropland created the need to use ever

higher levels of synthetic nutrients. And while the crop farms have too few nutrients these very same nutrients accumulate in cities and on the large-scale animal factory farms. Because of the long distances involved, these accumulated nutrients are not returned to the major crop-growing areas because the energy and financial costs are extremely high.

There are a number of severe environmental consequences of the developments described above:

- 1 Large amounts of non-renewable energy sources are needed to produce, ship, and apply the fertilizers. Production of nitrogen fertilizer is very energy intensive. Of all the energy used to produce an acre of corn in the United States cornbelt—including fuel, wear and tear on machinery, seeds, and pesticides—nitrogen fertilizer accounts for the largest amount (double the next largest category), approximately 40 percent.²⁸
- 2 Another adverse consequence arises because the fertilizers used are soluble and are thus prone to cause groundwater and surface water contamination. In addition, the high concentrations of livestock produce more nutrients than the surrounding soils can safely absorb. A direct health hazard results as the groundwater many use for drinking is contaminated with high levels of nitrates. Excess nutrients from agricultural production are also implicated in the deterioration of estuaries such as the Chesapeake Bay, and marine environments such as the Gulf of Mexico's dead zone to the west of the Mississippi River's mouth, as well as many freshwater lakes.
- 3 Even when cities are located near farms, the industrial contaminants, as well as chemicals in many of the products that people dispose around their homes, render most urban sewage sludges unsuitable for use on farmland. Although the U.S. Environmental Protection Agency considers most sludges safe for use on farmland, there are significant scientific concerns about the adequacy of these guidelines. U.S. standards are by far the most lax of all advanced industrial countries, with permitted levels of heavy metal eight times that of Canada and most European nations.²⁹ And there are potential contaminants in manures too—for example, routine feeding of copper to hogs raised in confinement to enhance their growth results in manures that have excessive copper levels. Disposal of contaminated sludges and manures causes environmental problems that may affect the future productivity of soils or the quality of air and water.

- 4 The lack of good rotations on most crop farms, partially caused by the availability of inexpensive synthetic fertilizers, has resulted in a loss of soil organic matter and a decrease in the diversity of organisms in the soil. This degradation of soil quality allows the growth of large populations of disease organisms and plant parasites that would have been held in check by a diverse community of competing organisms. Also, plants that are unhealthy tend to attract more insect pests than healthier plants. The upshot of this is that greater amounts of pesticides are used in an attempt to combat the increased pest pressures resulting from soil degradation. Thus much of the pesticide poisoning of farmers and farmworkers as well as the contamination of many foods and ground-water is a result of soil degradation.
- 5 The cruel conditions under which animals are raised in large-scale production facilities create conditions in which disease can easily spread, necessitating frequent use of antibiotics. In addition, the routine use of low levels of antibiotics in feeds, which function somehow as a growth stimulant, accounts for most of the 40 percent of total antibiotics that are used for animals. The constant use of medicines causes both antibiotic contamination of food and the development of antibiotic-resistant strains of bacteria, which can then become a human health hazard.
- 6 Mining operations undertaken to supply nutrients have resulted in substantial environmental damage. The fate of one of the victims of guano imperialism gives some indication of what can happen. The small South Pacific island nation of Nauru was under German control from 1888 to the First World War, after which it was under the control of Australia (except for Japanese occupation during the Second World War) until independence was gained in 1968. Strip mining of the phosphate-rich deposits began around 1908 and the deposit is expected to be exhausted within a few years. According to a *New York Times* article "four-fifths of the island has been mined out, leaving behind a pitted, ghostly moonscape. . . . The only habitable land is a narrow coastal fringe shaded by coconut palms. Because of the mining, even the weather has deteriorated. The waves of heat that rise from the mined-out plateau drive away rain clouds, leaving the sun-baked island plagued by constant drought."³⁰

Experiences of the Non-Capitalist World

The history of the non-capitalist world offers a few glimpses of other possibilities. The Soviet model, followed by most other countries in Eastern Europe, offers no help on this issue because it closely copied many of the methods used in the United States; lack of attention to cycling of nutrients and care of the soil was partially offset by applications of fertilizers and pesticides. However, in China under Mao things were different. China has an extremely low amount of arable land per capita, but has had a long tradition of carefully cycling nutrients to maintain soil fertility (as noted by Liebig in the nineteenth century). Mao's emphasis on local food self-sufficiency in each region helped to reinforce these practices and, together with the encouragement of local industry, slowed down urbanization at the same time as impressive advances were made in agricultural production. But in the transition to capitalist relations that is now far advanced, nutrient cycling and careful soil management have decreased substantially, and there is a new emphasis on building fertilizer factories to supply the nutrient needs of agricultural production.³¹ In Cuba, the economic crisis of the Special Period has been caused by the cancellation of favorable trade agreements with the collapse of the Soviet Union. Lack of funds to purchase fertilizers and pesticides from abroad created an interest in reducing the use of such materials, and organic production techniques have become a mainstay of Cuban agriculture with attention paid to nutrient cycling issues.³²

What Can Be Done?

What can be done to remedy the break in the cycling of nutrients in the advanced capitalist countries and the resulting environmental consequences? Without a major challenge to the structure of agriculture and corporate decision making, a profound change in the nature and sizes of cities and the curbing of suburban development, and a moratorium on the continued introduction of new synthetic chemical compounds until their environmental safety is proven beyond a doubt (all unlikely in the near future), there remain few options. These include encouraging the consumption of locally grown food and the recycling of clean food wastes from homes, restaurants, and markets back onto farmland. And seeking out of farmers that follow environmentally and socially sound practices at farmers markets and through the new Community Supported Agriculture farms (CSAs,

where individuals and families buy shares in the production of the farm before the season starts) can help as well. A massive effort can also be undertaken to clean up sewage sludges by eliminating the contamination of sewage with potentially toxic wastes from industries as well as individual homes. This will be resisted by industry because of the large expenditures required for most to have zero discharge of toxic materials. Although such activities will not solve the problems, they will make a difference. And during the struggles, the mutual education of those interested in broader societal issues, on the one hand, and those concerned with sustainable agriculture and environmental issues, on the other, could lead to more permanent future alliances.

From a longer-term perspective, it is important to understand that neither a lack of technology nor a lack of understanding of ecological processes are standing in the way of sustainable agricultural systems today. Although there is plenty to find out, we already know how to design and implement agro-ecosystems that are biologically sustainable, taking into account soil nutrient cycles and other factors. But the mass of farmers cannot use this knowledge and survive under the current economic-social-political structure.

A humane and sustainable system, socialist and based on sound ecological principles, will concern itself with sustaining the earth, as Marx wrote, "as the inalienable condition for the existence and reproduction of the chain of human generations." To fail to take these more fundamental issues into account in our current struggles would be to ensure our failure not only in the cause of social justice, but also in fulfilling our obligations to the earth—understood as the ground we live on and the bio-geological processes that sustain us. One thing we can be assured of: future generations will only look at us askance if we allow ourselves to give in at any point to a system, such as the present one, run on the principle "*Après moi le déluge!*"³³

- 1 See Kozo Mayumi, "Temporary Emancipation from the Land," *Ecological Economics*, vol. 4, no.1 (October 1991), pp. 35–56; Fred Magdoff, Les Lanyon, and Bill Liebhart, "Nutrient Cycling, Transformation and Flows: Implications for a More Sustainable Agriculture," *Advances in Agronomy*, vol. 60 (1997), pp. 1–73; Gary Gardner, *Recycling Organic Waste: From Urban Pollutant to Farm Resource* (Washington, D.C.: Worldwatch, 1997).
- 2 Jean Boulaine, "Early Soil Science and Trends in the Early Literature," in Peter McDonald, ed., *The Literature of Soil Science* (Ithaca: Cornell University Press, 1994), p. 24; Daniel Hillel, *Out of the Earth* (Berkeley: University of California Press, 1991), pp. 131–2.
- 3 J. M. Skaggs, *The Great Guano Rush* (New York: St. Martin's Press, 1994).

- 4 Margaret W. Rossiter, *The Emergence of Agricultural Science: Justus Liebig and the Americans, 1840-80* (New Haven: Yale University Press, 1975), pp. 3-9; Karl Marx and Friedrich Engels, *Collected Works*, vol. 38, p. 476; James F. W. Johnston, *Notes on North America*, vol. 1 (London: William Blackwood and Sons, 1851), pp. 356-65; Marx, *Capital*, vol. 3 (New York: Vintage, 1981), p. 808.
- 5 Henry Carey, *Principles of Social Science* (Philadelphia: J. B. Lippincott, 1867), vol. 2, p. 215, and *The Slave Trade Domestic and Foreign* (New York: Augustus M. Kelley, 1967), p. 199.
- 6 Justus von Liebig, *Letters on Modern Agriculture* (London: Walton and Mabery, 1859), pp. 171-83, 220. Liebig's criticism of the "spoliation system" was made even more explicit in the revised 1862 edition of his *Agricultural Chemistry*, which influenced Marx. See William H. Brock, *Justus von Liebig: The Chemical Gatekeeper* (Cambridge: Cambridge University Press, 1997), pp. 175-9.
- 7 Boulaine, "Early Soil Science," p. 25.
- 8 Brock, *Justus von Liebig*, pp. 250-72.
- 9 James Anderson, *Observations on the Means of Exciting a Spirit of National Industry* (Edinburgh: T. Cadell, 1777), p. 376, *Enquiry into the Nature of the Corn Laws; with a View to the New Corn Bill Proposed for Scotland* (Edinburgh: Mrs. Mundell, 1777), pp. 45-50; J. R. McCulloch, *The Literature of Political Economy* (London: Longman, Brown, Green, and Longmans), pp. 68-70.
- 10 David Ricardo, *Principles of Political Economy and Taxation* (Cambridge: Cambridge University Press, 1951), p. 67. Ricardo did not deny altogether the possibility of improvement in agriculture but gave it a very limited role. "Improvements in agriculture," he wrote, were "of two kinds: those which increase the productive powers of the land, and those which enable us, by improving our machinery to produce with less labour." The former type of improvement was mainly associated with "more skillful rotation of crops, or better choice of manure." *Ibid.*, p. 80. It seems to have been a key assumption of the Ricardian rent theory that such improvements could have only a limited impact on fertility, and could in general be abstracted from altogether.
- 11 Karl Marx, *Theories of Surplus Value*, part 2 (Moscow: Progress Publishers, 1968), pp. 114-7, 121-5.
- 12 *Ibid.*, pp. 241-4; James Anderson, *A Calm Investigation of the Circumstances that Have Led to the Present Scarcity of Grain in Britain: Suggesting the Means of Alleviating the Evil and Preventing the Recurrence of Such a Calamity in the Future* (London: John Cumming, 1801), p. 5.
- 13 James Anderson, *Essays Relating to Agriculture and Rural Affairs*, vol. 3 (London: John Bell, 1796), pp. 97-135; Karl Marx, *Capital*, vol. 3 (New York: Vintage, 1981), p. 757.
- 14 Anderson, *A Calm Investigation*, pp. 73-5.
- 15 *Ibid.*, pp. 12, 56-64.
- 16 Karl Marx, *Grundrisse* (New York: Vintage, 1973), p. 527.
- 17 Karl Marx, *Capital*, vol. 1 (New York: Vintage, 1976), pp. 637-8. Marx's argument was similar to that of Liebig in *The Natural Laws of Husbandry* (New York: D. Appleton and Co., 1863), p. 180 (this was the English translation of vol. 2 of the 1862 edition of Liebig's *Agricultural Chemistry*.)

- 18 Marx, *Capital*, vol. 3, p. 195.
- 19 On the relation of Marx's concept of sustainability to his vision of communist society see John Bellamy Foster, "The Crisis of the Earth," *Organization & Environment*, 10: 3 (September 1997), pp. 278–95.
- 20 Marx, *Capital*, vol. 3, pp. 948–9.
- 21 Ibid., p. 911.
- 22 Karl Kautsky, *The Agrarian Question* (Winchester, MA: Zwan, 1988), vol. 2, pp. 214–5.
- 23 V. I. Lenin, *Collected Works*, vol. 5 (Moscow: Progress Publishers, 1961), pp. 155–6.
- 24 Gardner, *Recycling Organic Waste*, p. 43.
- 25 Judith Sommer, David Banker, Robert Green, Judith Kalbacher, Neal Peterson, and Theresa Sun, *Structural and Financial Characteristics of U.S. Farms, 1994* (Agriculture Information Bulletin No. 735, Economic Research Service, U.S. Department of Agriculture), p. 79.
- 26 Ibid., p. 87.
- 27 Ibid., pp. 84–5.
- 28 D. Pimentel and G.H. Heichel. "Energy Efficiency and Sustainability of Farming Systems." In R. Lal and F. J. Pierce (eds.) *Soil management for sustainability* (Ankeny, Iowa: Soil and Water Conservation Society, 1991), pp. 113–123.
- 29 Gardner, *Recycling Organic Waste*, p. 34.
- 30 *New York Times*, December 10, 1995, p. 3.
- 31 For a discussion of the burning of crop residues in China, see William Hinton, "The Importance of Land Reform in the Reconstruction of China," in Fred Magdoff, John Bellamy Foster, and Frederick H. Buttel, eds., *Hungry for Profit: The Agribusiness Threat to Farmers, Food, and the Environment* (New York: Monthly Review Press, 2000), pp. 215–30.
- 32 See Peter Rosset, "Cuba: A Successful Case Study of Sustainable Agriculture," in Magdoff et al., *Hungry for Profit*, pp. 203–14.
- 33 "Après moi le déluge! is the watchword of every capitalist and of every capitalist nation. Capital therefore takes no account of the health and length of life of the workers unless society forces it to do so." Karl Marx, *Capital*, vol. 1 (New York: Vintage, 1976), p. 381.

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